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THE

RETROSPECT

OF

PRACTICAL MEDICINE AND SURGERY,

BEING

A Half-Yearly Journal,

CONTAINING A RETROSPECTIVE VIEW OF EVERY DISCOVERY AND PRACTICAL IMPROVEMENT IN THE MEDICAL SCIENCES.

EDITED BY

W. BRAITHWAITE, M. D.,

LATE LECTURER ON MIDWIFERY AND THE DISEASES OF WOMEN AND CHILDREN AT THE LEEDS SCHOOL OF MEDICINE, ETC.,

AND

JAMES BRAITHWAITE, M. D., LOND.

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PRACTICAL MEDICINE,

&c., &c.

DISEASES AFFECTING THE SYSTEM GENERALLY.

1.—ON AN EPIDEMIC OF TYPHOID FEVER.

By Dr. Robert Perry, Physician to the Glasgow Royal Infirmary.

[During March 1868, Dr. Perry's attention was directed to the existence of an epidemic of typhoid fever in the neighbourhood of the Garnkirk Fire-Clay Company's works, by the admission under his care into the Glasgow Royal Infirmary of five cases of that disease. The cause of the epidemic, having been investigated, was removed. The origin and mode of propagation of typhoid in isolated places such as this is, are always more instructive and consequently more interesting than they are in large towns.]

I may state, for the information of those who are unacquainted with the situation and surroundings of the Garnkirk Fire-Clay Works, that they are situated at about six miles from Glasgow, immediately on the line of the Caledonian Railway, from which a line of rails enters the works for the purposes connected with the manufacture of the fire-clay bricks, tiles, and many other articles, which are noted over the globe for their superior quality. Directly adjoining the works, and on ground rising somewhat towards the north and west, are a number of cottages inhabited by the work-people and their families. The entire population of the surrounding houses may be roughly estimated at between 600 and 700. Beyond the workmen's cottages, and extending on every side, is an undrained moss, beneath the surface of which the famous fire-clay is found. With the exception of one or two small farm-houses and some pitmen's cottages, there are no other dwelling-houses within nearly a mile of the works. On the north side of the kilns and work-shops, and surrounded almost on three sides by the cottages, is a large pond or reservoir of water for the use of the works and work-people. This reservoir is supplied with water from an adjoining clay-pit, the shaft of which is situated about 500 yards distant. The water is pumped out of the pit, and conveyed to the reservoir through fire-clay pipes, which are embedded only to a very slight depth in the ground. The number of men at work in the pit at the date of my inquiry was about fifty, and at that particular time the number was much less than the average of those who usually found employment there. I ascertained that there were no privies in the pit, and that the pitmen were in the habit of passing their evacuations, when necessary, at any convenient part of the workings. From the clayey nature of the floor of the pit, it can readily be understood that little or no absorption takes place, and the whole drainage of the pit gravitates to the bottom of the shaft, whence it is pumped up, and the water so collected passes through the before-mentioned pipes to the reservoir. The greater part of the surface drainage from the ground surrounding the cottages, as well as the sewage and waste water from the houses, is intercepted before reaching the reservoir, and carried off by open surface drains running parallel with it, and those open drains are regularly swept and kept clean. At the end of the pond, however, at which the water supply pipe is led in, I observed a considerable quantity of sewage and surface drainage finding their way into the

reservoir. From this fact, and judging from the general appearance of the water in the reservoir, there could be no doubt of its being largely contaminated with sewage and putrefying matter; but, on the other hand, there is no proof that the water taken directly out of the reservoir is ever employed for drinking or cooking. At the back and side of the row of cottages, immediately adjoining where the conducting pipe passed, I observed that the ground was thickly studded with human excrement, and refuse thrown out from the houses, the privies and dungsteads being somewhat deficient there. Workmen were, however, engaged in preparation for building them, and I understand that the deficiency has since been supplied.

In addition to other measures recommended, I advised that the joints of the conducting pipe in the neighbourhood of the cottages should all be carefully examined and made secure. I have since been informed that when this was done, one of the fire-clay pipes at this particular part was found to be broken, and, moreover, that the surface water from the ground to which I have just referred was seen to flow into the broken pipe.

Here, then, was a clear proof of the impure and unwholesome state of the water passing through the pipe; and as all the water for domestic use was drawn from this pipe as it falls into the reservoir, seeing there is no other source of supply, we need feel no surprise at the outbreak of enteric fever which took place amongst those who made daily use of it. I regret that I have not been enabled to make out the exact amount of impurities in either the pit or reservoir water by an accurate chemical analysis. I requested a specimen of the water to be sent to me for the purpose of analysing it; but my request was not complied with.

Throughout the cottages adjoining the works there had occurred during the past month, and up to the date of my visit, about forty-five cases of enteric fever (without being strictly accurate as to numbers). A few of the cases had been removed to the Glasgow Royal Infirmary; but the majority were under treatment in their own homes. There was also one patient suffering from enteric fever in a cottage on the opposite side of the railway, and situated only a short distance from the works; and it is an interesting fact to note that the inmates of this cottage derived all their water-supply from the same source as the people in the works.

Mr. Murray also mentioned to me that he had at that time one patient suffering under the same fever in the village of Chryston, which is nearly two miles from Garnkirk; but that up to the time of his seizure he was employed in the fire-clay works. I was not able to hear of any cases of the disease among the workmen of the same company who resided at a place called Crow-row, less than half a mile distant from Garnkirk, but which is supplied with water from a different source.

It is worthy of remark, that the proprietors of the works have for years been in the habit of furnishing, gratis, a filter for the use of the inmates of each cottage. Only a few, however, of the householders availed themselves of this offer; and it is somewhat remarkable that I did not find a single case of fever in any of the houses where the water was regularly filtered before being used for drinking or culinary purposes. Mr. Murray subsequently informed me that one or two cases did occur among those who used the filters; but that the proportion of those attacked in the houses where filters were in use was very much smaller than among those who used the water unfiltered.

Very shortly after the adoption of the measures recommended for the prevention of the contamination of the water, a marked diminution in the number of individuals attacked was observed to take place. In about a month after, the fever was almost eradicated, there being only five or six cases, and those of a much milder type, and principally confined to children. There were in all above sixty individuals attacked, and amongst these the proportion of fatal cases was very small. At the commencement of the epidemic the type of the fever was somewhat indefinite. Bronchial symptoms were more prominent than enteric symptoms, and several of the patients were sent into the general medical wards of the Glasgow Royal

Infirmary as cases of bronchitis. In a short time, however, the abdominal symptoms became more decided, and the characteristic diarrhœa, which was altogether absent in many of the earlier cases. soon assumed a very severe form.

I endeavoured to trace out the history of the first case of enteric fever that had occurred at the works, and likewise if any connexion could be discovered between the first and the succeeding ones. A rumour was mentioned to me of two men having recently come to the works who were at the time suffering from, or were immediately after attacked by, the fever. On strict inquiry, however, I was not able to find any foundation for this rumour.

Whether the germs of the disease were introduced from without, or originated *de novo* in some of the individuals who were using the water contaminated as I have pointed out, is not in this instance able to be proved beyond doubt. It is certain, however, that the very first case occurred in one of the cottages in the row immediately adjoining where the pipe conducting the water passed, and where I before mentioned that the privies and dungsteads were deficient.

If, as is more than probable, the intestinal discharges from this first case found their way into the pipe, the propagation of the fever by this means was most certain; and if the manager had not promptly carried out the recommendations for the suppression of this and the other likely sources of its propagation, there is but little doubt that the consequences would have been much more disastrous.—*Lancet*, *June* 6, 1868, *p.* 718.

2.—THE FUNGUS THEORY OF DISEASE DOUBTFUL.

In a short communication to the *Centralblatt*, Drs. Bergmann and Schmiedeberg describe a crystalline substance, to which they have applied the name "sulphate of sepsin," obtained from putrefying materials, and which they believe represents the proper poison of organic substances undergoing this kind of fermentation. It is obtained by diffusion through parchment paper, precipitation with corrosive sublimate from an alkaline solution, removal of the mercury by silver, of silver by sulphuretted hydrogen, evaporation, and purification of the residue. Large well-defined, acicular needles are thus obtained, which are deliquescent in the air, and, exposed to heat, melt and carbonise. They possess a powerfully poisonous action. A solution containing scarcely more than one-hundredth of a gramme was injected into the veins of two dogs. Vomiting was immediately induced, and after a short time diarrhœa, which in the course of an hour became bloody. After nine hours the animals were killed, and on examination their stomachs and large intestines were found ecchymosed and the small intestine congested. Frogs could be killed in the same manner.—*Lancet*, *Oct.* 17, 1868, *p.* 518.

3.—ON THE RELATION OF FOOD TO WORK DONE IN THE BODY.

By the Rev. Dr. S. Haughton, F.R.S.

[About two years ago Drs. Fick and Wislicenus, of Zurich, published an article in the Philosophical Magazine, founded upon an examination of urine secreted during an ascent of a mountain. This paper proved that the force due to the urea excreted in a given time is not sufficient to provide the actual work that may be done by the muscles in the same time.]

Liebig and his followers, misled by a preconception of the simplicity of nature, assigned to nitrogenous food the duty of providing the force necessary for the production of muscular work, by supplying the waste of muscu-

lar tissue; while they supposed the farinaceous and fatty foods to provide the amount of animal heat required by the body.

The opponents of Liebig have fallen into the opposite error, and deny that nitrogenous food contributes any portion of the force employed in muscular work.

The truth, as is usual, lies between the two extreme hypotheses, and we are now compelled to admit that a given development of force, expressed in animal heat, muscular work, and mental exertion, may be the effect of several, perhaps many, supposable supplies of digested food, farinaceous, saccharine, fatty, and albuminous.

Just as a given algebraical function may be equated to a given constant, by the use of a certain definite number of values of its variable quantity, so may a given effect of work in the animal body be produced by certain definite, though very different, combinations of various kinds of food, the digestion of which follows each its own law, and developes its own amount of force. The number of roots in our equation of life increases the difficulty of solving it, but by no means permits the acceptance of the lazy assumption that it is altogether insoluble, or reduces a sagacious guess to the level of the prophecy of a quack.

Lavoisier supposed in his earlier investigations that animal heat was developed by the combustion of carbon and hydrogen in the lungs, just as in earlier times it was supposed to be produced spontaneously in the heart, which was imagined to be so hot as even to burn the hand that should imprudently venture to touch it.

In like manner, Liebig and his followers supposed the muscular work to be developed in the substance itself of the muscles that were its instruments.

Both of these doctrines are now justly repudiated by physiologists, and the view proposed in 1845 by Dr. Mayer, of Heilbronn, and recently developed with much ability by Mr. C. W. Heaton, of Charing-cross Hospital, in the Philosophical Magazine for May, 1867, that the blood itself is the seat of all the chemical changes that develope force in the body, has gained favour among physiological chemists, and also met with acceptance among practical clinical observers.

Thus the human mind revolves in cycles, and the physicians of the nineteenth century are preparing to sit at the feet of Moses, and learn that the blood of an animal really constitutes its life, while South African theologians reject his authority, because he happened to confound a Rodent with a Ruminant.

No two classes of animals can well differ more from each other than the cats and ruminants, one of which is intended by nature to eat the other. They differ in all respects as to food, the cats requiring a supply of fresh meat and blood for their health, and the ruminants being exclusively vegetable feeders; yet in both classes we find a great development of muscular power and of rapid action of the muscles, qualities alike necessary to the pursuer and to the pursued. There can be no doubt that muscular work is developed in the cats from the combustion of flesh, and in the ruminants mainly, if not exclusively, from farinaceous food. It is, however, worthy of remark that the muscular qualities developed by the two kinds of food differ considerably from each other. The hunted deer will outrun the leopard in a fair and open chase, because the work supplied to its muscles by the vegetable food is capable of being given out continuously for a long period of time; but in a sudden rush at a near distance the leopard will infallibly overtake the deer, because its flesh food stores up in the blood a reserve of force capable of being given out instantaneously in the form of exceedingly rapid muscular action.

In conformity with this principle, we find among ourselves an instinctive preference given to farinaceous and fatty foods, or to nitrogenous foods, according as our occupations require a steady, long-continued, slow labour, or the exercise of sudden bursts of muscular labour continued for short periods. Thus chamois hunters setting out for several days' chase provide themselves with bacon fat and sugar; the Lancashire labourers use flour and fat, in the

form of apple dumplings; while the Red Indian of North America almost transforms himself into a carnivore, by the exclusive use of flesh food; he sleeps as long, and can fast as long, as the puma or jaguar, and possesses stored up in his blood a reserve of force which enables him, like a cat, to hold his muscles for hours in a rigid posture, or to spring upon his prey, like a leopard leaping from a tree upon the back of an antelope.

If the preceding view of the muscular qualities developed by the two kinds of food be correct, important inferences suggest themselves as to the food that should be employed in relation to several kinds of work. Of these inferences, I shall select two examples :—

1. The nurses of one of our Dublin Hospitals were formerly fed chiefly upon flesh food and beer, a diet that seemed well suited to their work in ordinary times, which was occasionally severe, but relieved by frequent intervals of complete rest. Upon the occasion of an epidemic of cholera, when the hospital duties of the nurses became more constant, although on the whole not more laborious, they voluntarily asked for bacon fat and milk, as a change of diet from the flesh meat and beer; this change was effected on two days in each week with the best results as to the health of the nurses, and as to their power of discharging the new kind of labour imposed upon them.

2. I have been informed, on competent authority, that the health of the Cornish miners breaks down ultimately, from failure of the action of the heart and its consequences, and not from the affection of the lungs called "miner's phthisis." The labour of the miner is peculiar, and his food appears to me badly suited to meet its requirements. At the close of a hard day's toil, the weary miner has to climb by vertical ladders through a height of 100 to 200 fathoms before he can reach his cottage, where he naturally looks for his food and sleep. This climbing of the ladders is performed hastily, almost as a gymnastic feat, and throws a heavy strain (amounting from one-eighth to one-quarter of the whole day's work) upon the muscles of the tired miner during the half-hour or hour that concludes his daily toil. A flesh-fed man (as a Red Indian) would run up the ladders like a cat, using the stores of force already in reserve in his blood; but the Cornish miner, who is fed chiefly upon dough and fat, finds himself greatly distressed by the climbing of the ladders—more so indeed than by the slower labour of quarrying in the mine. His heart, over-stimulated by the rapid exertion of muscular work, beats more and more quickly in its efforts to oxidate the blood in the lungs, and so supply the force required. Local congestion of the lung itself frequently follows, and lays the foundation for the affection, so graphically, though sadly, described by the miner at 40 years of age, who tells you that "his other works are very good, but that he is beginning to leak in the valves."

Were I a Cornish miner, and able to afford the luxury, I should train myself for the "ladder feat" by dining on half a pound of rare beefsteak and a glass of ale from one to two hours before commencing the ascent.

Application of Theory to Diseased Conditions of Body.—The relation of food to work, complicated enough in health, becomes more so in disease, and the problem to be solved by rational theory becomes still more difficult. I cannot attempt even to sketch an outline of this part of my subject, considered in general, but shall content myself with asking your attention to three remarkable examples of disease which illustrate the principles I have attempted to lay down.

These diseases are—

A. Typhus Fever.
B. Cholera Asiatica.
C. Diabetes mellitus.

A. *Typhus Fever.*—In typhus fever a prominent symptom is the remarkable elevation of temperature, accompanied by an increased excretion of urea and carbonic acid by the kidneys and lungs, indicating (as no food is taken) an increased morbid metamorphosis of the blood and tissues. The temperature frequently rises to 104° Fahr., representing an increase of upwards of 5° Fahr. above the normal temperature.

If we knew the cause of this increase of temperature, or rather of the increased metamorphosis of which it is the sign, we should know the cause of typhus fever, and learn to combat the disease on rational grounds. At present the cause is unknown, therefore the physician is forced to treat the symptoms as they appear, instead of attacking the cause of the disease. Let us examine for a moment the terrible significance of the symptoms.

Your patient lies for nine or ten days, supine, fasting, sub-delirious, the picture of weakness and helplessness; and yet this unhappy sufferer actually performs, day by day, an amount of work that might well be envied by the strongest labourer in our land.

The natural temperature of the interior of the body is 100° F., while the temperature of the corresponding parts in typhus fever is at least 105° F. This seems at first sight a small increase—only 5 per cent. of the whole; but it is in reality 2½ times as great as it appears, and actually amounts to 12½ per cent., or *one-eighth* part of the total animal heat. For the total quantity of heat given out by the heated body is proportional (from Newton's law of cooling) to the elevation of its temperature above the temperature of equilibrium, towards which it tends. If we suppose this equilibrium temperature to be 60° F., then the quantities of animal heat given out in typhus fever and in health will be in the proportion of 45 to 40, showing that the animal heat of typhus exceeds that of health by *one-eighth* of its amount.

We have already seen that the work due to animal heat would lift the body through a vertical height of eight miles per day; and it thus appears that an additional amount of work, equivalent to the body lifted through one mile per day, is spent in maintaining its temperature at fever heat.

If you could place your fever patient at the bottom of a mine, twice the depth of the deepest mine in the Duchy of Cornwall, and compel the wretched sufferer to climb its ladders into open air, you would subject him to less torture, from muscular exertion, than that which he undergoes at the hand of Nature, as he lies before you, helpless, tossing, and delirious, on his fever couch.

The treatment of this formidable disease in former times consisted of purging, vomiting and bleeding the patient, with the view of eliminating an imaginary poison, and so helping nature to terminate the disease.

In modern times, thank God, the physician either does not interfere at all, or adopts the rational process of retarding the disintegration of the tissues consumed to supply the fever heat, by furnishing in their stead fuel, in the form of wine and beef-tea, sufficient to maintain the increase of temperature imperiously required. This practice may be justly considered rational, because the condition of the circulation admits of its application, and it is considered good, because it has been rewarded with success in the hands of the skilful clinical physician. In concluding this sketch of the prominent symptom of typhus fever, and as an illustration of the eagerness with which every possible combustible in the body is made use of, I may mention, on the high authority of Dr. Stokes, of Dublin, that the very urea excreted by the kidneys is not permitted to leave the body without first paying its tax to fever, by being burned into carbonate of ammonia, thus rendering the urine of an advanced case of a bad typhus fever eminently alkaline.

B. *Asiatic Cholera.*—This remarkable disease presents, as every one knows, three distinct stages; viz.:—

1. The premonitory stage of diarrhœa.
2. The stage of collapse.
3. The stage of consecutive fever.

The stage of collapse exhibits the following symptoms:—Vomiting or purging, muscular cramps, suppression of bile and urine, lowering of body temperature to 95° F., extreme prostration of strength, extremities pulseless, and face Hippocratic.

When death occurs during collapse, the following symptoms are usually found on careful examination of the corpse:—The temperature rises to 103° F., the muscles give out their characteristic susurrus CCC, and exhibit spon-

taneous movements, the whole train of symptoms producing the effect of a ghastly attempt at resurrection.

In this disease we have phenomena respecting animal heat, the very reverse of those found in typhus fever; the body performing one vertical mile short of its daily work, instead of one mile in excess. The prostration of strength resulting from this deficient combustion is so great, that death is often caused by bringing the patient to hospital in a cab instead of upon a stretcher, by his walking up a dozen steps into his ward, and sometimes even fatal results have followed a sudden effort to sit up in bed to vomit.

The rise of temperature after death, and the continuance of muscular susurrus and motion, tend to prove that the impeded circulation, which is the prominent symptom in cholera collapse, is due to constriction (probably vaso-motor nervous) of the capillaries, in consequence of which the muscles are deprived of their supply of freshly oxidised blood, the result of which is necessarily contraction and cramp, which produces the excessive agony that characterises this disease.

All authorities on cholera, whether their object be to "impede" or to "assist" nature, are agreed that medicines, whether astringent or purgative, are not only useless, but dangerous, in the stage of collapse.

It is useless to give alcoholic fuel to restore the loss of animal heat, for there is no circulation to cause the oxidation of the hydrocarbons.

It is equally useless and more dangerous to give opium, to check the remaining purging that exists; for if vomiting have ceased, your acetate of lead and opium pills lie as if in the stomach of a corpse, and at the termination of collapse your patient enters upon the consecutive fever with perhaps a dozen grains of opium in his stomach, placed there like an explosive shell by your ill-timed zeal, and rapidly passes into a comatose condition, from which he never for a moment rallies. His death is always accredited by the registrar to cholera morbus, and not to opium.

Purgatives and emetics in cholera collapse effect the same object as opium, but with greater rapidity. In the stage of blue collapse the chances of life and death are almost exactly equal, and the slightest additional loss of force turns the wavering beam on the side of death. The effects of a brisk purgative or emetic (if they act) upon a patient unable to climb a dozen steps or sit up for a quarter of an hour without fatal syncope, may be easily imagined; and the use of them cannot be justified by any arguments borrowed from right reason.

A remarkable though transient improvement takes place in collapse by the injection of warm water (brought to the specific gravity of serum by the addition of mineral salts) into the veins or bowels; the patient loses the cramps, feels that he is about to recover, speaks to his friends, and often transacts whatever business is necessary, but speedily falls back into collapse. The improvement in his condition is altogether due to the temperature of the fluid injected, which supplies for a brief period the deficient animal heat, permits a partial oxidation of the blood, restores the capillary circulation in the muscles, and so destroys their cramp; and by supplying the deficient work required, removes for the moment the fatal prostration of strength. Any one who has witnessed the remarkable effects of warm liquids thus injected in cholera collapse must feel that recovery would be certain if the improvement could by any possibility be made permanent.

Our hopes for the future, as to the treatment of cholera, lie, as I believe, in the direction of supplying to the body directly its lost animal heat. I have witnessed the happiest results from an injection of warm salt water into the bowels, assisted by hand friction of the surface with turpentine and chloroform, and the application of bags of hot salt along the spine; in cases treated in this manner we may expect to witness cessation of muscular cramp, restoration of perspiration to the skin, with increase of capillary circulation, and finally, to reward our efforts, a return of the excretions of urine and bile; when these reappear, all vomiting and purging cease, and our patient is almost cured.

After recovery, the contrast between the cholera and fever patient is as

great as it was during sickness. The fever patient has been overworked for nine or fifteen days without a suitable supply of food, and, when convalescent, experiences a complete exhaustion of strength that lasts for many weeks. The cholera patient, on the other hand, has been prevented from working by constriction of the capillary vessels, caused by the absorption of the cholera poison, and feels, on recovery, much like a man that has been half drowned, while the fever patient resembles a man that has been half starved; the one is able to return to his work in the course of a few days, the other only after the lapse of as many weeks.

C. *Diabetes mellitus.*—This disease furnishes us with one of the best proofs that all the chemical changes, by means of which work is produced, take place in the blood and not in the tissues of the body; and, at the same time, an examination of its phenomena explains satisfactorily the regimen and diet which has been found, by experience, most suitable to the diabetic patient. I shall illustrate the disease by a case which was placed under my control, by Dr. Stokes, some years ago.

A young man, aged 20, named Murphy, suffered from fever (enteric?) in November, 1859, and, on recovering, became diabetic; he was admitted into the Meath Hospital in October, 1860, where he remained, under my observation, until his death on January 12, 1861.

He was allowed for nine weeks to eat as much as he liked of certain kinds of food, which were varied, week by week, to suit his wants, my object being to obtain, if possible, the natural constants of the disease undisturbed by external interference; the only medicine used by Dr. Stokes's order being opium, to produce sleep, and a little creasote occasionally to promote digestion. As the details of this experiment have been fully published, I shall confine myself to the final results. His food and excretions were analysed from week to week, so as to determine the total quantities of sugar-forming and urea-producing food, as well as the sugar and urea actually excreted.

During six of the nine weeks the sugar excreted was in excess of the sugar ingested, and the mean of the daily excretion and ingestion of sugar were:—

Sugar excreted . . .	9773 grs.
Sugar ingested . . .	9321 "
Diff.	452 "

During two of the nine weeks of observation the urea excreted was in excess of the urea ingested, and the mean daily excretion and ingestion of urea were:—

Urea excreted	1182 grs.
Urea ingested	1349 "

The foregoing facts illustrate strikingly one of the prominent symptoms of diabetes—viz., the canine appetite—the quantity both of sugar-producing and urea-forming food consumed is more than double what is necessary to maintain a vigorous labourer in perfect health. An examination of the excretions explains the other prominent symptom of diabetes—viz., the complete prostration of strength in the patient, notwithstanding the great amount of food consumed.

In a state of health, food produces three excretions only—viz., urea, carbonic acid, and water; in diabetes the farinaceous foods appear in the excretions as sugar, and not as carbonic acid and water; and the work necessary to maintain animal heat must be provided altogether at the expense of flesh food, which is the very form of food least fitted to maintain it.

The diabetic patient resembles a racing steamboat on the Mississippi whose supply of coal is exhausted, and whose cargo furnishes nothing better than lean pork hams to throw into the furnace to maintain the race. It cannot be wondered at that our poor patient, under such disadvantageous conditions, ails to keep in the front.—*Medical Times and Gazette, August* 22, 1868, *p.* 203.

4.—FACTS CONNECTED WITH THE DURATION AND DIAGNOSIS OF RHEUMATISM.

By Dr. S. O. Habershon, Physician to Guy's Hospital.

What is rheumatism? and what is the value of its statistics?

From the variabilities in our English climate, rheumatism is a disease of most frequent occurrence, and not only do instances continually arise in ordinary practice, but it is almost the exception to find any person who has arrived at years of maturity who has not at one period or other suffered from rheumatic pain. Still, it is beyond the reach of our present knowledge to say precisely what rheumatism is, or to indicate the changes which take place in the organic chemistry of the system during its attack. Some affirm that peculiar metamorphoses induce a disordered condition of the fibroid tissues of the body, and that in some persons these changes are more easily excited than in others, constituting a "rheumatic diathesis." Others advance a step further and assert, that the production of lactic acid by perverted nutritive changes constitutes the proximate cause of rheumatism. Dr. Prout suggested that this acid was the origin of the rheumatic symptoms, and Mr. Simon and Dr. Richardson have demonstrated that if introduced into the system, as by injection, it will produce symptoms of cardiac inflammation resembling rheumatic endo- and peri-carditis; and the presence of acid perspiration, the excess of euric and sulphuric acids in the urine, have seemed to favour such an hypothesis. But *one* symptom does not constitute rheumatism, for there is in this malady a disturbance of the whole organism, and not only the blood and fibrous tissues, but the entire *nervous* system is involved in the morbid process.

It is not surprising that there is a remarkable difference in the severity and in the duration of rheumatism; and, in many instances, these peculiarities may be explained by constitutional complications. Both inherited and acquired morbid tendency thus greatly modify the course of rheumatic disease; one malady does not preclude the existence of another; these associations are often overlooked, they render an uniformity in treatment almost impossible, and they greatly *diminish the value of statistical returns.*

Some of these complications may be briefly dwelt upon, and they are of undoubted importance in everyday practice.

1. Rheumatism occurring in strumous subjects.
2. Rheumatism after syphilis, without ordinary periostitis.
3. Rheumatism with, or directly after, gonorrhœa.
4. Rheumatism in persons of intemperate habits.
5. Rheumatism in advanced life.
6. Rheumatism with miasmatic poisoning.
7. Rheumatism accompanying zymotic disease.

1. The occurrence of rheumatism with struma is by no means an unusual event. It is not only found amongst the poor, but even amongst those who are enabled to use every means of protection from exposure to cold, and from the inclemency of the weather. I might adduce many instances which have come under my care in the wards of Guy's Hospital. In some of these delicate patients, there is a greater tendency to persistent effusion into the joints; and in some patients organic disease of the larger joints is preceded by a true rheumatic attack; such cases are happily, however, rare. A short time since, a young man, on admission under my care at Guy's, was found to have effusion and commencing caries of the knee joint, and it was considered as of a rheumatic character, for several other joints had been affected in a transient manner at the commencement of acute symptoms. Again, it has appeared to me that rheumatic effusions into the pleura are most difficult of absorption in strumous subjects; and it is probable that acute cardiac affections run a more rapid course.

In directing the treatment of rheumatism, a strumous diathesis should receive special consideration. Violent measures are badly tolerated, and

the convalescence is thereby greatly retarded, even if irreparable mischief is not induced. Strumous subjects are most unfavourable for any depletory measures; and we cannot too strongly express our sentiments in reference to the free use of mercurial medicines. We have seen acute pericarditis come on during salivation, followed by great irritability of the heart; and the convalescence of patients affected with rheumatism, who have been treated with mercurial medicines so as to affect the system, is, we believe, slow and tedious.

Another fact well worthy of consideration, in reference to the effect produced by preparations of mercury, is that, when the valves of the heart have been thickened and contracted from old rheumatic disease, the relief arising from the increased activity of the abdominal glands by this medicine is often very marked; but, unless it be speedily withheld, the muscular fibre of the heart becomes enfeebled and thereby dilatation is increased; and in some instances we have witnessed ulceration in an old damaged valve, which was possibly due to the same cause.

A favourite plan of treatment with some practitioners is the very free use of alkalies in acute rheumatism; but neither is this plan free from injurious effect, especially in strumous subjects. There are three conditions that we have thought attributable to, or, at least, greatly promoted by, this excessive administration of alkalies; 1, great anæmia; 2, excessive irritability of brain; and 3, irregular choreal movements. The alkalies, doubtless, enter the blood, and that perhaps more readily than any other medicine; and, when given in immoderate quantity, they change the blood constituents in a manifest degree. The second condition of functional irritability of the brain is, perhaps, due to a similar cause. We are well aware that all these states may be quite independent of these remedies; but we believe that these conditions may arise from the improper use of remedial agents.

We do not mean to affirm that alkalies, when given so as to produce more free action of the kidneys and other glands, are not of service, nor that a free mercurial purgative is not also beneficial; but to administer ounce after ounce of alkaline remedy to neutralise so much lithic acid or lactic acid, because the perspiration and the urine are unusually acid, is certainly neither physiological, nor is its good result borne out by clinical experience.

Strumous subjects with rheumatism soon bear the preparations of steel with advantage, as the iodide of iron, the potash tartrate, &c.; and in some, especially chronic cases, cod-liver oil is of great value.

2. Periosteal disease is a common sequence of syphilis; and not only does the true periosteum become affected, but other fibroid tissues are implicated; pain is produced, and the patient is said to have rheumatism; but, besides this spurious rheumatism, persons who have been poisoned by syphilis are often the subjects of true rheumatic disease of the joints; the joints become red, swollen, and painful, and the malady presents all the characters of the simple ailment. We have, however, found that it subsides less easily, and is very apt to return on the slightest exposure to cold and wet.

In the treatment, alkalies are often of great value, especially the iodide of potassium; and, where there is diminished power, these alkaline remedies should be combined with quinine or with bark in one or other form.

3. Whilst some altogether deny the existence of gonorrhœal rheumatism, others regard it as a form of pyæmia; gonorrhœa is, unfortunately, so common a disease, that a very many hospital patients are found with it; and in many instances only a short period elapses before the symptoms of rheumatism are developed, or they arise whilst the discharge continues. What, however, is the relation of the two ailments? Is their occurrence a mere coincidence? or does the pain in the joints arise from a poisoned condition of blood allied to suppurative fever? Instances have occurred in which acute suppurative articular disease of a fatal kind has happened, several joints being involved, for which no cause could be traced, but the gonorrhœa then existent. Still, whilst numerous instances of gonorrhœa occur without any articular affection, or any recognisable disease of the blood, the following instance shows the manner in which the veins sometimes become

involved. A patient, some years ago, was admitted under my care into Guy's Hospital for acute pneumonia on the right side. The symptoms were well marked; and, with saline treatment (bicarbonate of potash), he speedily convalesced, and was about to leave the hospital. Fatal symptoms, however, very unexpectedly came on; for, after a good night and partaking of his usual breakfast, even assisting to clear away the breakfast things, he told the nurse that he was faint; he sat down upon the edge of his bed, and in about half an hour he died. The lung was recovering, as we expected, and the pneumonia deposit in it had become nearly absorbed; but we found what had previously not been ascertained, that he had recently suffered from acute gonorrhœa. The veins at the base of the bladder were filled with adherent fibrine, and the iliac veins were in a similar state; and a clot separated from these veins had been carried to the right ventricle, and the action of the heart became so embarrassed as to cause speedy death. Rheumatism associated with gonorrhœa or gleet is, we believe, unusually persistent.

4. In persons of intemperate habits, whose vessels have become diseased and the viscera damaged, we have another cause for longer duration in an attack of rheumatism; but this obstinacy of character is still more manifest where—

5. The malady occurs at a period of life, when the vessels have become degenerated. Senile rheumatism has peculiarities, and one of them is greater persistency.

6. When persons who have resided in miasmatic districts become affected with rheumatism, there is a more marked periodicity in the symptoms; one day the skin being normal, the next clammy and perspiring, with rheumatic pains. We have witnessed, with enlarged spleen, sudden severe eruption on the skin, at first, in red blotches of roseola, and afterwards blebs, resembling rupia escharotica, shewing that there was, at least, peculiar cachexia, modifying the rheumatic affection.

7. Instances have been recorded, in which zymotic diseases, as typhus and typhoid, have been accompanied with rheumatism. I have never witnessed well marked instances of this kind; but there is nothing opposed to the known facts of disease, that an affection, having its origin in disordered metamorphic changes, should co-exist with one arising from animal poison, as typhus. It must, however, be remembered, that some cases of pyæmia closely resemble typhus fever. A few months ago, a woman was under my care in the hospital for chronic rheumatism. She slowly convalesced, and was about to return home partially relieved. In the next bed was a severe case of typhus, and the rheumatic patient became alarmed, the tongue became dry and brown, the pulse small and very compressible; there were no maculæ, and the temperature was not much increased. It was feared that she might sink from exhaustion; stimulants were given freely; she rallied in a few days, and left the hospital. It was doubtful whether the symptoms arose from nervous alarm, or whether the contagion of typhus had anything to do with the sudden prostration. If, then, there be such complications, and others that might be mentioned, statistics, unless compiled with more than ordinary care, must be exceedingly deceptive and of comparatively little value.

Again, whilst there are many characteristics of true rheumatic disease, few maladies are more easily mistaken, and there is *no* sign which is *uniformly* present. Pain is, perhaps, the most constant indication, with stiffness of one or other joint; but rheumatic pericarditis may, and often does exist, without any pain whatever. The same may be said in reference to febrile symptoms, to increase of temperature, and to changes in the urine; none of these signs are pathognomonic.

Many maladies are designated rheumatic which have no connexion with that disease.

1. *Diseases of the spine* are often said to *commence* with an attack of rheumatism; but it will generally be found that the pain in the course of the nerves or in the fibrous tissues arises from direct implication of the nerves or of their centres.

2. The same remark applies to pain produced by the pressure of *cancerous*, *aneurismal*, or other tumours. Thus cancerous disease of the lumbar glands is often mistaken for lumbago; so also the pain from aneurismal disease of the thoracic and abdominal aorta, when no pulsating tumour can be detected, is referred to rheumatism.

3. During the course of *renal disease*, abnormal irritation arises not only in the serous membranes, producing pericarditis, pleurisy, peritonitis, &c., but a similar change happens with the synovial membranes, and a form of disease is induced which simulates rheumatism.

4. In chronic poisoning by *lead*, vague pains in the fascia, as well as in the joints, have been designated "saturnine arthralgia."

5. We have already referred to *periosteal disease* as a source of fallacy in the diagnosis of rheumatism.

6. *Shingles* or *herpes zoster* may be found in the course both of the cerebral and spinal nerves; and the severe pain which precedes the eruption of the vesicles, and which also follows their disappearance, closely simulates local rheumatism.

7. A more important disease, and one which is attended with fatal issue, is *pyæmia*. It closely resembles rheumatism; for, with rigor and febrile symptoms, there is fixed pain and swelling in the joints—first one, and then another, being affected, though without subsidence of those parts first attacked. But, whilst there may be some similarity in the symptoms, the prognosis is widely different. The one is generally a curable disease; the other, a fatal one.

We might also refer to the severe pains in the back which precede some of the exanthems, as small-pox; and to the general *malaise* of fever; but these could scarcely be mistaken for rheumatism. And, lastly, the symptoms described as arising from acute *trichinous disease* have some resemblance to rheumatism in the pain in the limbs. I have never seen an instance of a patient dying in consequence of this affection, although in numerous cases I have witnessed the trichina spiralis in the muscles after death.

It is an excellent rule, whenever there is local pain, to examine for a local cause; but it is often surprising to notice the strange maladies which are designated as rheumatic, at one part or other of their course, from the character of the pain; and, even when the disease is truly rheumatism, we attach but little value to statistics drawn up without reference to individual peculiarity. The natural result of this disregard of constitutional difference is to follow a routine plan in the remedies employed; in fact, treating the disease rather than the patient. We believe that rheumatism may be greatly relieved, or shortened in its course, by the proper use of means; and we strongly deprecate the treating of mere symptoms, as both injurious and unphysiological. But we would urge that each case be estimated in all its relations; and that a patient having severe rheumatism should not be at once dosed with calomel and opium, or with a certain number of drachms of saline medicine, irrespective of every other consideration.—*British Medical Journal*, *June* 30, 1868, *p.* 603.

5.—THE TREATMENT OF ACUTE RHEUMATISM.

By Dr. N. J. Butler, Blackrock, Dublin.

As I think many practitioners are not aware of the extraordinary efficacy of valerian, administered in the form of a bath, in subduing the pain and inflammation attending acute rheumatism, particularly of the arthritic form, I consider I am merely fulfilling a duty to the profession and public by mentioning it. It was first introduced to my notice by my friend, Dr. Adrien—a name known and honoured in the annals of Dublin surgery—since which time I had opportunities of testing and proving its wonderful power of arresting and cutting short the most violent attacks of acute rheumatic arthritis. The bath is made simply by taking lb. i. of valerian root, boiling it gently

for about a quarter of an hour in one gallon of water. Straining and adding the strained liquid to about twenty gallons of water in an ordinary bath. The temp. should be about 98°, and the time of immersion from twenty minutes to half an hour. Pains must be taken to dry the patient perfectly upon getting out of the bath. If the inflammation remain refractory in any of the joints, linseed-meal poultices should be made with a strong decoction of valerian root, and applied.—*Medical Press and Circular, August* 5, 1868, *p.* 133.

6.—THE REMOVAL OF CANCER BY CAUSTIC ARROWS AND CARBOLIC ACID.

By Dr. J. R. Wolfe, Ophthalmic Surgeon to the Aberdeen Royal Infirmary.

[The favourable termination of the following cases increases the interest attaching to them from the mode of treatment adopted.]

Case 1.—*Epithelial Cancer.*—J. B., aged 51, farm servant, applied for advice at the Royal Infirmary, Aberdeen, in May, 1867, on account of a tumour in the inner canthus of the left eye. The tumour was about the size of a large walnut, rounded in form, hard, inelastic, and nodulated to the touch, immoveable, being firmly attached to, and involving part of both eyelids, affected every now and then with attacks of lancinating pain. He stated that it began about nine years ago, in the form of a small wart at the inner angle; it remained nearly stationary for a considerable time, but some months ago it had begun to enlarge, and continued to progress rapidly.

On being told that it was malignant, and would require an operation for its removal, he left the hospital, and did not again present himself till July 3rd, at which time the tumour had begun to break up on the surface by ulceration; being covered with a crust, and having an ichorous discharge, of a slightly offensive smell, spreading and infiltrating the subintegumental tissue. Examined with the microscope, it presented the ordinary characters of epithelial cancer. The awkward situation in which it was placed rendering it difficult of removal by the knife, without producing cicatrices which would have given rise to considerable deformity of the eyelids, I had recourse to the following procedure.

Five openings were made with a broad lance, into which caustic arrows were inserted; one of these was in the centre of the tumour; the other four were in the healthy skin round its margin; and the neighbouring parts were protected by a patch of leather, having an opening cut in its centre of sufficient size to embrace the tumour. The whole was covered with a compress of dry lint and bandage. As the patient complained of no pain, nor any irritation, he was allowed to move about the ward as usual.

On the third day, the whole tumour came away, leaving a grey-coloured slough, which was detached in the course of twenty-four hours by the use of linseed-meal poultices. The surface now exposed was clean, and presented irregular elevations, which bled very readily. The gap left was so deep as to expose freely the inner wall of the orbit as far back as the middle of the eyeball. The surface was now painted with strong carbolic acid, and the whole covered by wadding dipped in glycerine. This treatment was continued for three days; by which time the bleeding elevations had disappeared, and the whole presented an uniform granulating surface. It was then covered with carbolised wadding dipped in glycerine; the dressing being changed every second day, and the wound washed with a weak solution of carbolic acid. Under this treatment, the gap filled up rapidly; and in a fortnight it was entirely healed.

In August, I exhibited the case at the meeting of the North of Scotland Medical Association; when the skin about the inner canthus and eyelids presented its natural appearance, and scarcely a trace of cicatrix remained to show that loss of substance of such an extent had occurred.

I had an opportunity, quite recently, of examining the patient, and found the cure complete. The only traces (and these only to be observed on minute inspection) are: a slight elevation at the inner angle, as if the periosteum there were thickened, and the obliteration of the tear-duct, which, however, does not give rise to any inconvenience.

Case 2.—Cancerous Cyst.—E. A., aged 68, domestic servant, was admitted into the Royal Infirmary, October 12th, affected with a hard tumour of the left inner side of the lower eyelid and cheek, measuring two inches and one-eighth in its largest diameter; of an oval shape, irregular and nodulated on the surface, and presenting the appearance of small abnormal vessels ramifying on its cutaneous surface, which was completely adhering. On puncturing it, there escaped a quantity of bloody serum and air-globules, which evacuation, however, did not diminish the size and hardness of the tumour. This fluid, when examined under the microscope, presented a mixture of cells and granules, but of so undecided a character as not to make it clear whether these were cancerous, or merely the products of an inflamed cyst; but the bulk of the tumour, &c., showed unmistakeable characters of malignancy. The tumour was removed by caustic arrows, as in the last case, and dressed with carbolic acid. The patient was discharged in eighteen days, scarcely any appreciable cicatrix being left. and still continues well.

Remarks.—The advantages of this mode of treatment appear, as far as two cases prove anything, to be the following.

1. It is painless. Patients walked about the wards as if nothing had been done, and complained of no feeling of pain or discomfort whatever.

2. The tumour is completely eradicated; and, under the action of the antiseptic, which acts in the first instance as a caustic to the diseased tissue, healthy granulations are produced, which completely fill the gap, and leave little or no trace of a cicatrix.

This method appears exceedingly valuable for removing tumours from regions where no skin can be obtained from the neighbourhood; and is also applicable to erectile tumours, nævi, cancer of the breast, &c., occurring in patients, places, or seasons of the year, when the use of the knife is to be dreaded.

On my mentioning the result of my cases to Professor Gosselin, he told me that for the last few years he had rarely used the knife for the removal of cancer of the breast in the Hôpital la Pitié, but regularly resorts to the use of caustic arrows. The result is, that he does not now meet with cases of erysipelas, which used to be very common in his wards. He showed me several cases under treatment; but they were not sufficiently far advanced to enable me to judge of the appearance of the cicatrices, or to decide how much of the beautiful result above detailed is due to the carbolic acid and how much to the arrows; in short, to determine whether the same result might not be obtained by the use of the knife and carbolic acid.

The arrows employed I obtained from the Pharmacien of Hôtel-Dieu, Paris, who prepares them by dissolving chloride of zinc in a little water, making a saturated solution, and mixing it with sufficient starch to make a stiff paste, which is rolled into a thin cake, cut into shape, and dried at 212° Fahr. Although elsewhere I have claimed priority in the use in this country of carbolic acid as a dressing for wounds, yet I by no means wish to undervalue the great service rendered by Professor Lister to surgery in the systematic employment of it. Having seen its employment in Professor Lister's wards in the Glasgow Infirmary, I may be allowed to bear testimony to the skill, care, and originality, with which his experiments have been carried out.—*British Medical Journal, Sept.* 19, 1868, *p.* 303.

7.—A READY MEANS OF APPLYING CHLORIDE OF ZINC IN CANCER.

Mr. Weeden Cooke sends us an account of a process he has devised for this purpose, and which he finds most useful. Following a plan adopted in

some hospitals, of steeping lint in solution of sulphate of copper and liq. ferr. perchlor., and afterwards drying it, he has been substituting chloride of zinc for these substances, and finds this preparation most convenient for application. "The chloride of zinc, being a highly deliquescent salt, requires scarcely more than exposure to the air to render it liquid; at least a very few drops of water will quickly produce this effect. The lint is thoroughly soaked with this liquid, and hung up for a short time. It does not dry so completely as the iron or blue lint, owing to the deliquescence of the zinc. It preserves its active properties for weeks, if kept in a wooden or pasteboard box, such as a seidlitz-powder box. An old pair of scissors should be kept for cutting it, and forceps coated with vulcanite may be employed in its application or removal. The great convenience of the chloride of zinc lint is that the smallest pieces may be used, even to a wart or pimple, or to parts such as the eyelids, to which it would be almost impossible to apply the old paste. There is also the advantage of confining the caustic effect absolutely to the part to be attacked. I have used it to those stubborn indurated ulcers at the inner canthus, be they lupus, rodent ulcer, rodent cancer, or what not, as well as the upper and lower lip, and other parts of the face, with the greatest advantage; and have obtained better results than formerly, because of the power of adapting the application exactly to the size of the eschar required, and the ease of keeping the lint on as long as need be, and re-applying it as often as may be necessary, with very little discomfort to the patient. It being always ready, the surgeon in going round his wards may himself apply this lint to a commencing slough, either in a cancerous breast, or an ulcerated leg, or a bed-sore, or a phagedæna, and at once check that which otherwise may give much trouble to stay. I had occasion to enucleate a large epithelioma, from the parts about the umbilicus, which dipped down so deeply as to render it probable that it had reached the inner wall of the abdomen. An eminent surgeon advised removal by the knife, but the patient objected, and I set to work with some trepidation to remove it by the means of the chloride of zinc. There being a large surface to destroy, I used at first the paste, taking away every other day the dead portions; some little bleeding occurred when these were removed, but by means of the iron lint it was readily checked. It was not possible by any amount of packing round the diseased part to prevent very troublesome excoriation of the healthy parts, and so, at the latter part of the treatment, it occurred to me to use the lint as I have above described. It answered perfectly, and the whole of the cancerous mass was removed, leaving a red healthy granulating surface, which soon healed by the application of resin cerate. In a very curious case, which seemed to combine the appearances of keloid and encephaloma, I have recently been able to discharge from the hospital to resume her usual occupation, after a twelve months' residence there, a patient upon whom I had twice operated by means of the écraseur for large growths of a soft spongy character, having an extended horny base. These soft excrescences reappeared, and I finally attacked them with the zinc lint so successfully, that for a time at least there seems a prospect of immunity. For uterine purposes also, this convenient method of using chloride of zinc is much to be commended. Passed up through the speculum to the diseased part, and covered by a further plug of dry lint, it does its work, if properly measured for the part destroyed, without injury to the healthy tissues."—*Practitioner*, *Sept.* 2, 1868, *p.* 181.

8.—RELIEF OF PAIN IN OPEN CANCER.

The field for experience in cancer at the Middlesex Hospital is, as well known, an unusually large one, and opportunity has therefore been afforded for testing fairly the action of remedies in affording relief in this distressing disease. We learn that the exquisite pain which belongs to open cancer is found to be best relieved by the stramonium ointment, which is employed at

this institution. The following is the formula for this in the hospital pharmacopœia:—Half a pound of fresh stramonium leaves, and two pounds of lard. Mix the bruised leaves with the lard, and expose to a mild heat until the leaves become friable, then strain through lint. The ointment thus prepared is spread upon lint, and the dressing changed three times a day.—*Lancet, August* 8, 1868, *p.* 185.

9.—ON THE TREATMENT OF PYÆMIA.

By C. S. Jeaffreson, Esq., Senior Resident Surgeon to the Royal Free Hospital.

[After relating a case of pyæmia which terminated favourably, the writer observes:]

Many persons would, perhaps, feel inclined to doubt this case being one of pyæmia in its most general sense, from the favourable nature of its result. He was throughout kept well under the influence of alkalies, his excretions being fully alkaline; and with this was combined a full allowance of stimulants and support.

This method of treating cases of septic infection has been ably advocated by Mr. Savory. Whether it acts by neutralising or modifying the poison, or whether, by maintaining the blood in a fluid condition, it tends to prevent that first step of coagulation which, in its secondary effects, plays such an important part in the history of embolism and metastatic abscesses, is a matter of speculation. Of this there can be no doubt: that the alkalies, being readily dissolved, are readily absorbed into the blood, upon which they exert a powerful influence, indirectly stimulating the excretions. This action may be summed up under three heads: 1. Direct antagonism of the poison; 2. Protection against coagulation; 3. Promotion of secretion and excretion. Doubtless the stimulants also play an important part in keeping up the circulation; and thus we may say that the indications to fulfil are, to keep the blood fluid, and to keep it circulating.—*British Medical Journal, August* 29, 1868, *p.* 219.

10.—NOTES ON THE TREATMENT OF CHOLERA.

By Dr. T. M. Lowndes, Bombay Army.

[In some remarks published in the Transactions of the Bombay Medical and Physical Society for 1860, Dr. Lowndes advocated the use of astringents with one or two full doses of opium at the commencement of cases of cholera.]

With respect to the treatment of the first stage, I have, since the time when my remarks were written, omitted entirely the use of astringents, finding that a draught containing fifteen or twenty minims of chloroform, with ten or fifteen minims of tincture of opium, with a drachm of spirit to render the chloroform miscible with water, was exceedingly efficacious. During several years, when cholera was more or less prevalent, I have treated a large number of patients by this method, and can only call to mind one case where the disease progressed to collapse, and two cases where diarrhœa went on to rice-water purging and vomiting. It may be objected to this, that these cases were not choleraic purging; but the vast majority of them occurred during the time when cholera was present, and the symptoms supervened between midnight and five in the morning, with crampy pains in the stomach and bowels. These cases in India are specially suspicious, the patient going to bed quite well, and being awakened at the time named. During the prevalence of severe cholera, the same result was observed. The orders issued were, that every person suffering from diarrhœa was at once to come to the hospital for treatment; and this medicine was administered, with the general result that but few required a second dose.

[The writer then gives two cases illustrating the plan of treatment pursued. Of these we reprint the first.]

Kublee, sepoy, aged about 25, was admitted May 22nd, 1866, at 10 a. m., complaining that he had much pain in the stomach, and saying that he had been purged three or four times during the previous evening, and that vomiting of white fluid had come on in the night. Pulse small and quick; anxious expression of face. He was ordered to have immediately fifteen minims of chloroform, ten minims of tincture of opium, and a drachm of spirit, in an ounce of water; and to have a mustard poultice applied. I was then called by the native doctor, and found that for the time the vomiting had abated; the pulse was very small and quick. He was ordered to have five grains of calomel immediately; and the following drink every hour, or more frequently, in ounce doses.

℞. Potass. chlorat. ʒj; acidi hydrochlorici fort. ♏viij; acidi nitrici dilut· ʒiss; aquæ ʒxxiv. M.

During the next four or five hours, he was purged two or three times, all rice-water evacuations. I saw him again at 3.30 p.m. He was collapsed; the eyes were sunken; the skin cold, but no sweating; the pulse barely perceptible, and that only at intervals. The voice was choleraic. He was ordered to repeat the calomel and chloroform, without the tincture of opium. At four p. m., I gave half an ounce of arrack in water, which was immediately vomited. He was ordered to have an ounce of Liebig's cold soup every half hour; and to continue the chlorate of potass drink. No raw meat could be procured, but a quantity of the soup was made from a freshly killed fowl, and he had the first dose about 5 p.m. At 6, I saw him again. No vomiting or purging; pulse markedly improved: skin warmer.

The soup was first given in 1860, in consultation with Dr. Ogilvy, then of Her Majesty's 33rd Regiment, whose remark as to its probable action was to the effect it seemed to supply to the blood what was removed by the purging. This, after careful consideration, I still think is the correct explanation. I would not wish to enter into any discussion in these short notes as to the pathology of collapse; but it will be seen I cannot altogether agree with Dr. G. Johnson's argument, able though it be. I think that the cases of sudden collapse, with little vomiting and little or no purging, admit of a different interpretation to what he has assigned.

The soup was made by placing eight or ten ounces of finely minced raw meat in one pint of cold water, to which eight drops of strong muriatic acid had been added, stirring with a bit of stick occasionally for ten minutes, and then straining. The soup will only keep good a few hours; but if a supply of lean meat be kept ready minced, it can be made almost as wanted. Salt should always be added.

Hitherto I have only given the soup when collapse was established: now I should be inclined to give it in any case where diarrhœa is accompanied with a failing pulse, and most assuredly when the characteristic discharges of cholera have come on.

I believe that at first, especially in collapse, the soup should be administered in small, but frequently repeated, doses. I generally give an ounce or two every hour, or sometimes every half hour, alternating it with the chlorate of potass drink. Water, cold or iced, in small quantities.—*Brit. Medical Journal, Aug.* 29, 1868, *p.* 216.

DISEASES OF THE NERVOUS SYSTEM.

11.—ON INFLAMMATION OF THE BRAIN, INCLUDING SOFTENING AND MENINGITIS.

By Dr. Samuel Wilks, Physician to, and Lecturer on the Practice of Medicine at, Guy's Hospital.

[It must be self-evident that inflammation of the brain cannot be treated after the simple manner of inflammation of the lungs; for in so complex an organ

as the brain the symptoms must vary immensely with the part affected, as also with the cause.]

As one of the chief results of inflammation is softening, and as this may arise under a variety of circumstances, I think it will be as well to allude to this first. Softening—or *ramollissement*, if you prefer the French term—is used in a very vague manner. Generally, when we say softening is present, we mean a chronic change has taken place in the brain substance, whereby it has become disintegrated, and its function lost. But softening, as a result of inflammation, may be acute, and be developed in a few days. Such a case we ought not to designate by the name of softening, but by that of cerebritis or encephalitis. In all acute inflammations the tissues become soft, but we should not therefore style the disease by one of its effects. We should not, for example, call pneumonia a case of softening of the lung. In the case of the brain, however, we are often compelled to speak of the result as if it were the disease itself, being altogether ignorant of the cause not only during life, but even after death, a doubt even then existing whether the softening be due to inflammation or be the result of a chronic disintegration from a change of nutrition. Then, again, besides these actual and tangible forms of softening, we are using the term in the vaguest possible sense, as applicable to a great variety of symptoms. Thus, when a person becomes a little feeble in his mind, and has some slight paralytic symptoms, we often say the patient has softening of the brain, intending only to express that some impairment has taken place in the cerebral structure, and not necessarily a change like that of softening, which is visible to the naked eye.

There are, no doubt, a large number of changes going on in the living brain whose effects are at once perceptible by some alteration in the working of the machine, expressed by some physical or mental failing, and which in any other organ would not be manifest. A slight structural change, for example, in the liver would not be apparent except perhaps by some general feeling of *malaise*, but in the brain this would at once evince itself. What these changes are, and how associated with distinct symptoms, we have yet to learn. I hear sometimes the remark made that morbid anatomy has taught us enough, and that all we want is some medical philosopher to arise to generalize from our facts and supply us with theories; but I think I am in a position to say that our facts are meagre or scanty, and that we are only in the infancy of the science of cerebral disease.

As regards this softening—this tangible softening, with its evident symptoms—we have been in the habit of expressing the difference between a chronic softening resulting from decay or degeneration and that arising from inflammation, and styling these white and red softening. You are familiar with the terms red softening as denoting inflammatory, and white as meaning a more passive or atrophic change. If, however, red softening does result from inflammation, then it would be more desirable to at once designate it inflammation of the substance of the brain, or cerebritis, or encephalitis; but the reason, as I before said, why we cannot do this is that it is only in exceptional cases that this inflammatory process is evident as an acute and idiopathic process, and thus we are obliged to speak only of the effects. In the majority of cases the softening is chronic and associated with other disorders. If the softening be of a red colour, we call it inflammatory, the redness being due to the greater vascularity. We are influenced also in our decision by the age of the patient, and by the circumstances connected with the illness. In older persons, and especially where the arteries are diseased, as in morbus Brightii, we expect to find rather the white or non-inflammatory softening.

Suppose we make a *post-mortem* examination and find softening, how does it display itself? In some cases, when you make a section through the organ, you see the hemisphere presenting a peculiar appearance in the medullary matter; a certain portion, more or less circumscribed, looks and feels pulpy, resembling somewhat a piece of blanc-mange. As a rule, however, it does not look thus smooth, but is disintegrated, and thus, if a section be made, it shows a broken surface. When you pass the knife through the substance,

it sticks to the knife, and if you stir it about you can make it into a pulp or paste. If merely a number of softened spots were present, these would be apparent, when you made the section, by an equivalent number of broken surfaces.

If the softening has proceeded a stage further, then the brain matter may be quite broken up, or be semi-fluid, and a portion of this running off, a depression is left. If a stream of water be allowed to trickle upon it, the brain matter may be washed away, and a distinct hole be left corresponding to the softened part. Sometimes even during life a disintegration and absorption occurs, so that, when you make a section of the hemisphere, you find a large hollow space filled with a fluid like lime-water and the *débris* of brain substance. All these cases where there is actual loss of substance come under the category of cases of white softening. They arise in connexion with diseased vessels and general decay. In the red or inflammatory softening the disintegration is not so great. Besides these two kinds, some authors have spoken of a yellow softening, which they surmise to be of a peculiar kind, and due to a chemical change going on in the fatty acids of the brain. In some of the best-marked cases, however, which I have witnessed, I have considered that the yellowness is due merely to an altered condition of the colouring matter of the blood which has been present in it.

Then again, showing how difficult it is to decide by the mere colour whether the softening is inflammatory or not, if we take the case of acute hydrocephalus or tubercular meningitis, we know that there is an inflammatory exudation into the ventricles, and that the central parts have undergone a remarkable softening; the septum lucidum and fornix and adjacent parts are broken down and diffluent, but they are perfectly white—milky white. So marked is this that those who maintain that a structure must be red to indicate inflammation would say that this central softening of acute hydrocephalus was due to a simple death or atrophy of the part, or had occurred from presence of so much fluid, which had, as it were, melted it down. Of this there is no proof, but, on the contrary, that the change is inflammatory. You no doubt might think that the microscope would positively inform us as to whether a softening was inflammatory or not, but I am sorry to say it does not do much for us in this respect; for when the cerebral structure is broken up, and a number of new products are present, it is extremely difficult to say whether inflammation has anything to do with the process or not. The microscope is extremely useful in proving the fact of softening, because, besides the broken nerve tubules, it displays a quantity of new formations, as granule masses, which, to say the least of them, are morbid. It often happens that we wish to know whether a part of the brain has undergone a morbid softening or not, and by using the microscope and finding these bodies we are sure of the fact.

Softening is most commonly localised, whether it be due to an acute or chronic cause, but occasionally we find large portions of the cerebral structures affected. In cases where there is much disease of the blood-vessels, spots of softened tissue may be found throughout the whole brain, and in the much rarer cases of acute encephalitis, nearly the whole cerebral structure may be found to be undergoing disintegration. In cases of this kind, destruction of so large a part of an important organ will of necessity very speedily bring about a fatal issue, but in instances of local inflammation and softening, life may be prolonged for many months, and ulterior changes result; one of the commonest is for the brain tissue to perish until a mere vacuity is left, containing a whitish fluid with remnants of blood-vessels. In some cases this cavity is lined by a smooth and tolerably thick membrane. Should the inflammatory process proceed to the stage of suppuration, then an abscess is formed. This may or may not be contained in a cyst. The latter, under these circumstances, is not merely a thin delicate membrane, but is a thick, firm bag, composed of tough lymph. A very important question, whether idiopathic inflammation of the brain ever ends in suppuration, you have heard discussed on other occasions—whether, indeed, a cerebral abscess does not signify either that the morbid process has been set up in the bones,

or that it is pyæmic. The question has a very wide pathological signification, referring as it does to the mode in which the various tissues of the body undergo their own peculiar modification in disease. It was the question which above all was most interesting to me when I reluctantly retired from the office of demonstrator of morbid anatomy; for after an experience of many years I could not but observe that the character of the tissues was as potent in the form which the morbid product assumed, as the supposed vice in the blood or constitution. For instance, it is said that cancer and tubercle are distinct elementary productions which may arise indiscriminately throughout every part of the body. Such is a prevailing idea, but not founded in fact, as I could show you did time and place allow; and, as regards suppuration, the same opinion is held. You are by this time aware that the old doctrine of inflammation and its various stages was taught by the Professors of Surgery, who took, as a type, the inflammation of the skin or cellular tissues, in which the different processes of lymph production—suppuration and gangrene—could be visibly followed. So strongly imbued were all with this doctrine of inflammation that it was denied that some organs could be the subject of it, as, for example, there was no such disorder as gastritis, because lymph was not found on the surface of the stomach, or an abscess in its walls. We are now learning that the morbid changes take place in the cell structures of the organs and tissues, and that each of these undergoes its own necessarily peculiar alterations in disease.—*Medical Times and Gazette, June* 13. 1868, *p.* 627.

12.—ON DISEASE OF THE SPINAL CORD.

By Dr. Samuel Wilks, Physician to, and Lecturer on the Practice of Medicine at, Guy's Hospital.

The true interpretation of pain in spinal disease is one of the most important matters to understand. In the first place it is undoubtedly true that the spinal cord may be diseased throughout its entire thickness without the patient experiencing any pain, and without indeed there being the slightest sign of shrinking when the back is struck. On the other hand, the most intense spinal pains are those which are caused by disease involving the nerves only, as in aneurisms, which corrode the spine and leave the cord itself untouched. Again, it has been found that in those cases of meningitis of the cord where pains in the limbs have been a constant symptom the roots of the nerves have been involved in the process. With these facts before us we have some general rules to guide us in the interpretation of pain, although I could not positively teach you that pain necessarily implied an implication of the roots of the nerve external to the cord. It is highly probable that to a certain extent an implication of the nerve-fibres within the cord may produce the same result, but pain is not a necessary consequence, I am sure. We may note also that the irritation of the nerve roots not only produces pain and excites the centres to corresponding movements, but also causes tonic spasm or rigidity. Thus, when the membranes are affected in common with the roots of the nerves, this rigidity may often be observed. I have seen a man who, having fractured and dislocated his spine in the upper dorsal region, had intense pain and rigidity of the arms, but as soon as the bones were replaced the pain and spasm passed off. In chronic inflammation of the membranes of the cord the surface of the medulla is generally involved, and thus there may be more or less paraplegia; should the disease at one spot have involved the entire thickness of the cord, then sensation is lost, but the excito-motor function in the part below may be more than usually exalted. on our museum is the spinal cord of a man showing great thickness and ossification of the membranes, closely adherent and bound up with the structure of the cord. This man lay quite paralysed, but his spinal centres were in the highest state of tension, so that it was painful to pass by his bed; the merest touch made his whole body quiver, the act of micturition threw him into convulsions, and, I believe, on one occasion a jar against his bed caused him to spring on to the floor. He was in the condition of a tetanised frog.

Let us see how these observations apply to cases before us, as, for instance, the case of the boy who was lately lying in Stephen Ward with disease of the dorsal vertebræ. His back projected outwards in consequence of an angular curvature, and thus, no doubt, a quantity of inflammatory or purulent material existed within the canal pressing on the medulla; and what might you think would be the result? You would suspect that he would be lying in bed with his legs stretched out, and quite paralysed as regards motion. The pressure not having reached the centre of the cord, you might think that sensation remained; also, as a pressure of this kind on the upper part of the spinal cord would involve the motor tract but leave the sensory entire, and as the medulla would be healthy below, that the true excito-motory function would remain. Thus you would expect that, although he would be perfectly helpless to move in the slightest degree, a tickling of the feet would cause a drawing up of the legs and their flexion on the body. You might also have expected from the membranes being involved, and consequently the existence of an irritation of the cord through the roots of the nerves, that there would have been some convulsive movements of the legs or rigidity. Now all these symptoms were actually present, and considering what, in all probability, was the nature of the case, you will see how they accord with all well-observed physiological and pathological facts.

Thus far, I think, is pretty clear; in some cases of spine disease we may find motion lost only, in others sensation only, or the two together. Then again, although the conducting power of the cord is lost, and with it a paralysis of sensation and motion, its true function may remain, for the former may be destroyed by the most limited layer of disease, supposing it involve the whole thickness of the organ, but let the cord itself below be destroyed, and then the excito-motor has also vanished. But is this all? Has the spinal cord, or the nerves proceeding from it, any other functions? It is thought by many that they have, and thus it is necessary to suppose that a nerve is a vastly more compound organ than was once supposed—that it contains filaments destined for special functions. It has been thought that the fibres which conduct impressions to the spine and those which reflect movements back again are different from the fibres which convey sensations to the brain and from those which carry down the dictates to the muscles. Of this division, however, there is no proof. Then, again, as I shall have presently to show you, there are some who think the muscles have their own sensory nerves, and that we are endowed with a true muscular sense. Again comes the important question, and one of the most vexed questions in nervous physiology and pathology, whether any influence is conveyed along the cord which involves the nutrition of the tissues, or whether the power which the nerves possess in this respect is derived from the sympathetic system.

But this is not all, for it is said that what we call common sensation may be divided into different varieties. I have not Brown-Séquard's lectures at hand, but I think I am right in saying that this physiologist states that there is one sense for touch, and another for the appreciation of temperature, another for such a sensation as would result from pinching or pain, and another for tickling. I could say from my own observation that I have seen a patient who was insensible as regards touch, yet appreciate a difference of temperature. Also it may be constantly observed that hysterical women, who make no complaint of inability to feel any object, yet will often allow needles to be thrust into them with impunity, and sometimes even have lost all power of judging of temperature. I believe Dr. Darwin many years ago separated sensations of heat and cold from those of touch and pain. In mentioning the name of the first distinguished physiologist, I might inform you that it is his opinion that every function of the nerves which appears distinct must have its appropriate filament, and thus he considers that every ordinary nerve contains fibres of eleven different kinds.

There are, first, the fibres which conduct sensory impressions, and then the conductors of motor influence. These are of two kinds—those which pass to and from the sensorium, and those which are connected with the spinal cord for the reflex or excito-motor actions. Then again there are fila-

ments which regulate the calibre of the vessels and their corresponding afferent nerves. If, now, we suppose there is a nerve which conveys to the sensorium the state of the muscle, and if the ordinary sensory nerve is composed of four different filaments, according to the several varieties of sensation already mentioned, we shall have described ten different kinds of fibres. I am not quite sure about the eleventh, but I think it is said that if any branches of a nerve supply a gland it is supposed that a specially appropriate filament is required for the secreting office.

These distinct filaments have never yet been demonstrated in every nerve, and there are some who think that there is no need for the supposition of their existence; that, for example, the excito-motor function of the spine is worked through the ordinary motor and sensory nerves; also that the spinal nerves may be influenced through their junction with the sympathetic without supposing that the latter sends distinct fibres to accompany them; and again, that the different varieties of sensation may be only different forms of impression conveyed through the same nerve.

The question of the compound function of nerves is of especial interest in reference to the question of their influence over nutrition. That such an influence does exist there can be no doubt, and the usual explanation is that the nerves have a controlling influence over the blood-vessels, but what exactly is the nature of these nerves and what their origin has not yet been quite ascertained. There are some physiologists and pathologists who see in chemical action all that is sufficient for the production of the changes in the tissues, whilst there are others who are content to speak of cell-growth altogether uninfluenced by nervous forces, and they enforce their statements by illustrations from the growth of plants and some lower animals, to say nothing of the growth of the human embryo itself. Admitting, they say, that nerve force may regulate or control nutrition, the latter must necessarily be independent of it in its actual operation. Those, on the other hand, who see a direct influence which almost amounts to a vital one propagated by a nerve, would illustrate the fact by cases where a nerve has been severed, and an atrophy of the parts below has resulted; or a nerve proceeding to a muscle has been injured, and the muscle has wasted. Also as showing the influence of the nerves on nutrition, there are the cases mentioned by Mr. Hilton, where an angry ulcer has healed on the division of the nerve leading to it, or where an ulcer on the face remained open until a neighbouring decayed tooth was removed. The herpetic eruption following a neuralgia would also seem to imply that the condition of the nerve and that of the tissues in the skin were inseparably connected. Dr. Addison had a notion that the chronic ulcer sometimes met with in young girls was due to nervous irritation and intimately associated with the palpitation of the heart, pain in the side, and other neuralgic symptoms so commonly met with in these patients.

In regarding the question of nutrition, we ought, if possible, to look at it in its integrity, and not, because the bent of our mind is towards one branch of science rather than another, make it either a subject of chemistry or one of physics; for we must be quite sure that the cells, the blood, and the nerves are all working in harmony, to say nothing of the lymphatics, which appear of late years to be left quite out of the question in discussing the various processes of nutrition. One great difficulty in judging of the effects of nerve-influence on nutrition has been due to the varying results of paralysis on the tissues; but this might be used as the strongest argument in favour of the compound character of a nerve, and that just as in one case the vaso-motor filaments are involved in disease, in another they might escape. If, for example, an ordinary compound nerve is divided, the totality of its functions is lost; but should that nerve contain filaments possessing different properties, and which, on reaching the spine, take their own respective destinations, it is clear that disease in different portions of the cerebro-spinal centres may involve only certain portions of the nerves, and thus the various forms of paralysis may be as numerous as there are distinct filaments and functions of the nerves. If, for example, there is loss of

motion without sensation, it is evident that the nerve is only partially paralysed, and if in one case nutrition is affected and not in another, we should suspect that a certain function of the nerve remained in the one case and was absent in the other. Now, it would be highly desirable to ascertain for certain where the vaso-motor filaments have their source, or, if there be not such in ordinary nerves, at what point of the nervous system the motor filaments receive their influence from the sympathetic. Certainly in central cerebral disease, there may be loss of sensation and motion, but nutrition is unimpaired; also in many cases of spinal disease, we observe the same, whereas there are other cases of disease of the cord where wasting of the muscles is most marked. Thus in the disease known as progressive muscular atrophy, the prime cause of the malady has been usually placed in the tissues themselves, because ordinary paralysis was not known to cause wasting of the muscle; but in answer to this, it may be said that some special part of the cord may be affected, and this will probably turn out to be the case. Waller's experiments, however, tend to show that the nutritive nerves do not altogether proceed from the spine, for if the roots of the spinal nerves be divided, the motor branch wastes away, whilst the posterior retains its integrity beyond the ganglion.

In illustrating this subject I would not attach too much importance to many examples which are constantly mentioned in proof of the importance of nervous influence on nutrition, for many of these would bear a different interpretation. Thus, there is the well-known case of the bedsore which so commonly accompanies paraplegia, and which might be used to exemplify the principle; but, on the other hand, it might be said that the inability to move for several days, and thus to relieve the pressure from a particular spot, would be sufficient for the effect, as shown by the restlessness which all people in health experience. The strongest argument in favour of such proposition is that if the patient be placed on his side the most extensive ulcer will often rapidly heal. The same remarks apply to the cystitis which occurs also in the disease. This might be referred to the removal of nerve influence; but, on the other hand, it may be said that the retention of urine causes decomposition, and if the bladder be continually washed the inflammation is prevented. As regards the oft-quoted case of ulcer of the cornea on division or disease of the fifth nerve, it is certain (as I have seen) that the ulcer will heal when the eyelid is closed, and thus all irritant substances prevented from affecting the anæsthetic surface.

The physiological connexion between the spinal nerves and the sympathetic has not yet been fully shown, for in many of the results obtained by passing galvanic currents through the body, it has not yet been ascertained what amount of result has been due to stimulation of the motor nerves or the sympathetic. Thus, in the interesting observations by Remak on what he calls *diplegic* contraction, the *rationale* of it is not very evident. He took a case of progressive muscular atrophy and applied one electrode beneath the right ear and the negative electrode outside the sixth dorsal vertebra, and then on closing the current a contraction took place in the left hand. Faradisation appears to produce the same results, and which are thought to be induced by stimulation of the superior cervical ganglion.—*Med. Times and Gazette, Oct.* 10, 1868, *p.* 411.

13.—ON PARALYSIS WITH WASTING OF MUSCLES, ESPECIALLY IN CHILDREN.

By Dr. J. Russell Reynolds, Physician to University College Hospital.

The causes of infantile paralysis are numerous, and some of them are well understood, inasmuch as they differ in no special manner from those which are encountered in after-life; but there are some forms of paralysis, of which young children furnish the examples, that we cannot refer to the commonly recognised conditions of hemorrhage, softening, tubercle, syphilis, and the like.

[From the fact that nothing beyond the paralysis has been observed, these cases have been sometimes called "Essential Paralysis." The following cases illustrate the disease.]

1. *Commencement of symptoms.*—A. B., a healthy girl, the youngest of three, born of healthy parents, without any premonition of disease of any kind, at the age of nine months "took cold in the head," was feverish, and heavy in manner, for nearly a week, but improved towards the end of that time, and tried to get up. It was seen, however, that she "could not put either foot to the ground," although both of the hands were moved quite freely, and there was no pain nor spasm in the lower extremities. In a very short time she moved and used the left leg as freely and firmly as before the attack of "cold," but the right leg was paralysed, and in the course of a few weeks was observed to be cooler, softer, and smaller than the other.

C. D., a fine boy, the fifth of six healthy children, at the age of four years suffered from some "stomach complaint," was "poorly" for about a week, complained of his legs being "sore," and was found, after keeping his bed for five or six days, unable to stand. At the end of a month he could walk, but, in doing so, dragged his left leg, which was then thinner, softer, and cooler than the right.

E. F., a boy who had "never had a day's illness," the youngest of eleven healthy children, when two years old became fretful, restless, sore all over, and lay on his back; "seemed to lose the use of all his limbs," and could not sit up; was distinctly feverish for a day, but for one day only; he moaned at night; but after a few days he seemed well. At the end of a fortnight he walked, but did so like a much younger child, and it was noticed that he made no use of his right arm—that the arm was thin, and especially so about the shoulder.

These three cases are sufficient to illustrate the ordinary manner in which the paralysis I am describing makes its appearance. The *febrile* symptoms were slight, and only of short duration; the constitution was good; there was no recognised cause of disturbance—no fall, no blow, no exposure to cold, no obvious external influence nor internal derangement which could account for the phenomena. The age at the onset of symptoms ranged from nine months to four years, and dentition did not appear to have exercised any influence in the production of the malady. In some cases, that have come under my notice after several years' duration, it has been affirmed that there were no febrile symptoms at the commencement, but that the child was suddenly, or accidentally, found to be unable to move any of its limbs, or even to sit up; but it must be remembered that slight accessions of fever are sometimes disregarded at the time, and are wholly forgotten afterwards. The child is put to bed because it is not well, and when it is "better" the paralysis is recognised. Laborde (in an excellent treatise entitled "De la Paralysie dite essentielle de l'Enfance") states that fever was present in four out of five cases that came under his observation; and where I have been able to learn accurately the previous history there has invariably been some period of distinct but slight and transient illness. I therefore beg you to remember this febrile mode of onset; the fever being of only one or two days' duration, being feebly marked, but continues in type so long as it lasts, and unaccompanied by the vomiting and marked nervous disturbances which, under other circumstances, so frequently characterise its presence in early life.

Sometimes, but not more frequently than once in five cases (Laborde), *convulsions* mark the onset of infantile paralysis; and there is occasionally nothing in their actual phenomena which will enable you to distinguish between them and the fits which may arise from dentition, from worms, and from organic disease of the brain. But usually there is an absence of those symptoms which pertain to organic diseases of the brain; there is no vomiting, no headache, no strabismus, and no spasm of the face. Commonly, the limbs are found rigid after the fit has passed away; sometimes there is but one fit, but more frequently there are two, three, or four. When convulsions are present there is no fever, and *vice versâ*, when febrile symptoms constitute the commencement of the malady there are no convulsions.

2. *General paralytic symptoms.*—When first observed the paralysis is usually at its maximum, both of intensity and extent. It is often general—not only the muscles of all the limbs, but even those of the trunk are affected; the child can neither stand nor sit up, nor use its arms. The lower limbs are more distinctly and more frequently affected than the upper, and it is very rare to find paralysis of the sphincters. Paraplegia is the most common form observed at an earlier period, and this form of paralysis may become persistent; but more frequently the "clearing up," if I may use the expression, of the paralytic state extends beyond the arms, and in a very short time—viz., from three to fifteen days, only one extremity remains affected. One of the lower limbs is more often paralysed than one of the upper; sometimes the right arm and the left leg are weakened; sometimes, but very rarely, there is hemiplegia.

The electric irritability of the muscles is distinctly diminished at the onset, and coolness and wasting of the limbs set in almost immediately.

There is no constant change in the sensibility of the skin, or of the organs of special sense; but reflex movements are sometimes, although not always, abolished in the affected limb.

Paralysis of the kind now described I have occasionally seen in the condition of *pregnancy*, having its onset in a precisely similar manner—*i. e.*, appearing as general palsy after two or three days of slight febrile disturbance, and then becoming localised in one limb. Apart, however, from pregnancy—which condition bears some strong resemblance in regard of pathological tendency to the state of infancy,—I do not know of any disease in the adult which exhibits the clinical history now detailed. Ordinary wasting palsy, which is unfortunately but too well known, differs widely in its mode of onset, and in the distribution of its symptoms.

3. *Stage of limited paralysis.*—The paralysed limb *wastes*, it fails to grow at the same rate as the healthy limb, and thus it often remains withered, smaller, and shorter than its fellow. But long before any difference can be detected in length, or even bulk, there is distinct coolness, flabbiness, and softness. The rapidity with which wasting occurs is remarkable; in the course of a few weeks it is appreciable not only by the hand and the eye, but by the measuring tape. In this disease, as in all others which affect the size of limbs, there is often an amount of malnutrition, that may be quite obvious to the sight and to the touch, which measurements fail to represent; and surprise is frequently felt when a disparity, very obvious to the eye, is recorded in small fractions of an inch. But in the wasting paralysis of children the amount of inequality is often very great, and may be recognised. at once and to the full, by measurement. Thus in C. D., the calf of the right leg was 10¼ in. in circumference, that of the left only 8 in.; and here there was no shortening of the limb. That the failure of nutrition was mainly in the muscles was indicated by the fact that the right ankle was 7½ in. in circumference, the left 7¼ in. Where the muscles were involved the diminution on the paralysed side was ⅛ of the circumference; where the muscles were not included the difference was only $\frac{1}{16}$ of the circumference. In the same case there was obvious wasting in the left gluteal region. but it is impossible for me to tell you how much wasting there was in this unmeasurable locality. A similar difficulty prevents me from telling you exactly how great was the wasting in E. F., for here the malnutrition was most obvious in the deltoid muscle, in the pectoralis major, the supra-spinatus, and infra-spinatus scapulæ. It is so evident, however, to the eye that no other measurement is needed to tell you that it is very great. The head of the humerus may be seen and felt almost as distinctly as if it were removed altogether from the soft parts; for the bone appears and feels as if covered only by the thin and flexible skin of childhood. Again, in G. H., whom you have seen recently in Ward 3, and whose early history was similar to those I have described, it was impossible to represent fairly in figures the amount in wasting, for both lower extremities were affected, and that to about an equal degree. The girl was generally thin, but the malnutrition of the legs, as compared with the arms, was most obvious to all who saw her.

Sometimes particular muscles, or groups of muscles, are especially affected; thus, in the upper limb the muscles around the shoulder, and in the lower extremity the extensor muscles lying outside the tibia. Of the former, E. F. afforded an excellent example; of the latter you have seen several illustrations, observing sometimes that instead of the natural roundness there was distinct hollowing external to the tibia.

The *degree of paralysis* varies from slight weakness to absolute immobility. If the leg be affected a child may simply "drag its foot" in walking, or it may be unable to do anything but crawl upon the floor. When G. H., who is now quite well, came into the hospital she could not stand, for in her the affection was paraplegic, and the wasting and weakness of the glutei were carried to an extreme degree.

The *electric contractility* of muscles is peculiar and interesting. In some cases it is entirely lost, but in others it is only diminished, exhibiting, except in the fact of diminution, its ordinary characters. But what is very remarkable is the following fact, that in certain medium cases, where the loss of voluntary power may be complete, but the failure of nutrition by no means extreme, the muscles respond at once to the application of an interrupted battery current of low intensity, and at the same time exhibit no action when an induced current of high power is directed upon them. This has now been observed so frequently that it must be regarded as a common—not an exceptional—fact in the history of such cases; and it may be displayed very readily by a comparison of the paralysed with the healthy limb. An induced current which causes violent contraction in the muscles of the healthy side awakens no movement in the wasted limb; and *vice versâ*, an interrupted battery current, which is too feeble to cause any contraction in the healthy muscles is sufficient to produce distinct action of the wasted muscles. There would appear, therefore, to be an exalted readiness of response to one form of electricity, a diminished readiness of action to the other. This condition is not limited to the paralytic state I am now describing. It has been observed in other diseases by myself, and by my friend, Mr. John Netten Radcliffe, who will, I hope, furnish the results of his large experience in this matter in a collected form.

The *sensibility* of the skin in the paralysed limbs I have examined very carefully, and have found it to be normal, when tested by the compasses, by the application of heat or cold, by pinching, pricking, and the electric brush.

The *reflex motility* has been, so far as I have seen, utterly abolished in those limbs which have been completely paralysed to the will.

The *temperature* of the paralysed extremity has been reduced in all the cases that I have seen. This reduction has been obvious to the hand, and has been verified by the use of the thermometer. I have found a difference varying from five to nine degrees Fahrenheit between the limbs of the same patient, and this after taking the utmost care to avoid sources of fallacy.

The state of *mind*, and of the *general bodily health*, may be, and usually is, that of perfect health; and it is almost infinitely rare to find anything like bedsores, or localised malnutrition of the skin.

4. *Consequences of paralysis.*—These are either simple uselessness, and all the discomforts which may follow therefrom in paralysis of any kind; or they are certain deformities which arise from the peculiar distribution of the paralysis and wasting. It is not my purpose to give you any description of these deformities, but you will at once see that they are the most marked when the paralysis is limited to particular groups of muscles; for then the antagonists of those muscles are thrown into overaction, and distortion of the limb is the result.

5. *Anatomy.*—The *muscles* and *bones* are small, and the former often lose all their characteristic structure; and, until recently, it has been affirmed that beyond these changes in the limbs nothing abnormal was to be found. You may read descriptions of post-mortem examinations in which it is stated that the brain, spinal cord, and nerves were in their natural state; and it is only of late that, by a process of more minute investigation, the real nature of

the malady has been discovered. M. Laborde has shown that there is a distinct change in certain portions of the *spinal cord*; that the anterior columns are more translucent than natural, and present a very appreciable greyish-rose tint to the naked eye; and that a similar change may be observed, although to a less degree, in the lateral columns. The consistence of these tracts of nerve-tissue is diminished; and upon microscopic examination there may be observed a marked proliferation of the elements of the connective tissue, cells and nuclei being dispersed in the midst of a finely granular substance, in which there are fibrils of extreme tenuity. In the parts which are the most affected nervous tubules are either lost altogether, or they present a varicose appearance; while the other portions of the spinal column preserve a perfect integrity.

6. *Treatment.*—There is nothing special to be observed in the treatment of the early febrile symptoms; but it is of the very highest importance that the nature of the affection should be recognised as soon as possible, and that the paralysis should be encountered vigorously.

The treatment which has been the most efficacious has been the judicious use of electricity—viz., its application, in proper forms and in suitable intensity, to the affected muscles. It often happens that, as in the case of G. H., which you have lately seen, the recovery is complete; and this after several years' duration of the paralysis. The most efficacious application is that of the interrupted battery current; and a curious fact is commonly elicited by its continued use. You find, for example, a group of wasted, palsied muscles, inactive to faradisation, but responding readily to galvanism. You apply galvanism on several occasions, and observe that gradually some voluntary power returns, and with this a diminution of response to the agent you are employing. The same muscles were unaffected by faradisation at the first; but now—as their voluntary power returns and their contractility to the battery current diminishes—they act readily when the induced current is applied. At this period in the history of a case I have found it desirable to change the form of electricity, and to employ faradisation, carefully avoiding the use of such power as shall cause pain to the patient. Galvanism requires most patient exhibition in cases of this kind: for many months it should be continued, provided that there be the smallest improvement in voluntary power, or in the nutrition of the limb. When, after six or eight applications of both faradic and battery electricity, there has been no appearance of electric irritability, I have seen no good result from its continued use. It is probable that, under such circumstances, the muscles are so changed in structure, or, rather, so thoroughly destroyed in proper texture, that nothing can restore them; and the only thing that can be done is to prevent the deformity which might arise from the unopposed action of those other antagonistic groups of muscles which yet retain their integrity.

Electricity may have its action assisted by frictions and passive movements; but I have not seen any definite result, *quoad* the paralysis or wasting, from the exhibition of drugs. Of course, if the child be out of health, you would do your best to bring it into a more favourable condition; and in one case you would give alteratives, in another iron, in a third cod-liver oil, and the like. But your main object must be to treat the muscles, and to treat them without delay.

7. Your *prognosis*, in a case of infantile paralysis, is bad when the loss of voluntary power is absolute, when the wasting is extreme, and when, after three or four applications of electricity, you can detect no trace of contractility in the muscles. It is bad under such circumstances, whether the disease be of old standing or of comparatively recent development. On the other hand, if some slight voluntary power remain, or even if, when it be lost altogether, you still find in the wasted limb some flickering contraction as you apply the battery current, you may confidently expect a cure or a notable improvement, although the wasting and the paralysis may be highly marked, and although they may have existed for many years, provided that you will persevere steadily in directing the course of treatment that I have described.

Even at the very onset of the malady you may form some notion of its probable severity by regarding the intensity of the initial fever: and you may, when the paralysis is passing into its period of localisation, ascertain by an electric examination the direction in which the malady will throw its strongest forces. Thus taught, you may often prevent the occurrence or full development of symptoms which are very obstinate when once established, and may relieve your patient, by the treatment of a few weeks, from that which, if once firmly rooted, may require twice as many months to cure.—*Lancet, July* 11, 1868, *p.* 35.

14.—ON COMPRESSION OF THE BRAIN.

By Jonathan Hutchinson, Esq.

[The symptoms given by most writers as those indicative of compression of the brain may much mislead us in practice. This is especially so in cases of injury to the head, in which if we rely upon them we are liable to overlook compression in nine out of ten cases in which it is present.]

We must include under the term "symptoms of compression," all phenomena which are due to the squeezing of the contents of the cranium. Now it is clear that there must be various degrees of it, and my first objection to the above description is, that if it applies at all, it applies only to the more advanced ones. Yet it is clear that one whose cranial cavity has been encroached upon to the extent of but one ounce, from effused blood, secreted pus, or depressed bone, must have his brain and its normal fluids (blood and cerebro-spinal serum) correspondingly compressed and diminished in volume; and that one in whom the encroachment amounts to two ounces ought to have double the inconvenience and so on, until the continuance of the functions of life is no longer possible. Writers ought, therefore, to be able to assign the symptoms of slight compression of the brain as well as those of the advanced degrees, for it may be that treatment is more important in early stages than in later ones.

Another distinction which we ought to make, is between general compression, or squeezing of the whole cerebral mass, and local compression of some one part. We must also think, in cases in which foreign materials are intruded into the cranial cavity, of the effects likely to be produced by stretching as well as by squeezing. In many positions, pressure upon one part would inevitably cause stretching of others, such as nerve-trunks, or commissural bands. Lastly, we must remember that compression induced suddenly is a very different thing from compression taking place by slow degrees. If the increase in the quantity of intruding material be very slow, we well know that, unless some special nerve-trunks chance to be involved, no symptoms will be produced, even when the amount is very considerable.

Speaking generally, the effect of the effusion of new material, *e. g.* blood, into the cranium, will probably be first to eject a corresponding quantity of normal fluid in order to make room. Thus, the quantity of cerebro-spinal fluid will diminish, and also the quantity of circulating blood, and the capillary circulation will be diminished. The venous circulation will be retarded, but probably the whole quantity of venous blood will not diminish nearly so early nor so much as that in the arteries. Many of the venous sinuses are protected from pressure, and the effect of pressure at the exit of a sinus from the skull would be just the opposite to that upon an artery—it would keep the blood in the vein, whilst it would keep it out of the artery. We may suitably remember the phenomena of glaucoma, as illustrating the effects of pressure on arteries and veins. It is, I think, perfectly clear that a squeezed brain must be, *quoad* the supply of arterial blood, an anæmic brain.

The degree of pallor will vary with the degree of compression. We have to ask next as to the conditions of local and of general compression. All forms of compression taking place suddenly, will, for a time, be chiefly felt locally, and will have the usual symptom of local lesion, namely, a local

paralysis or paresis. The portion of brain close to the compressing cause will be displaced and squeezed. After a little time, however, the adjacent portions of brain will yield, so as to accommodate the displaced portion, and the compression will become diffused and comparatively slight; so slight that its symptoms may wholly disappear. Only in certain positions, as for instance, of the cerebellum beneath the strong tentorium, is it possible that local pressure can continue permanently without becoming diffused. Pressure on any part of either hemisphere of the cerebrum will certainly, after a while, influence the other also. Clinical experience amply verifies this inference. I must again remind you that we must observe the distinction between mere pressure and stretching, and also between pressure upon nerve-trunks and pressure upon the central masses. In the case to which I have referred in the foot-note, the pupil of one eye became dilated and fixed, but this was clearly due to the local pressure of the blood-clot upon the trunk of the third nerve at the sphenoidal fissure. If blood be freely effused at the base of the brain, as from rupture of the basilar artery, it will lift the medulla and pons away from the bone, and by stretching the fibrils of the pneumogastric, speedily cause death without producing any general compression.

Examples of unmixed compression of the brain are very rarely met with. In the great majority of cases the injury is complicated, both by severe concussion and by laceration of the brain, and a mixed group of symptoms is the result. In the description which I have quoted, it is said the phenomena of compression "are those of apoplexy." Surely, however, the symptoms of apoplexy are most varied, and are, further, but rarely due to compression. In ordinary apoplexy some portion of the brain mass, often the thalamus or corpus striatum, is ploughed up by the extravasated blood, and the resulting hemiplegia is due to the laceration rather than to the effusion as a means of compression. Just so in the numerous cases in which injuries to the head are productive of laceration of the brain, and its concomitant extravasation into the arachnoid sac. My belief is, that in all these cases, the laceration is the far more important agent as regards the symptoms which follow. This is, I admit, difficult of proof, but I shall adduce cases showing, on the one hand, that severe lacerations, under conditions in which compression is impossible, are still attended by the symptoms referred to, and that, on the other hand, effusions of blood without laceration, if not of very great extent, cause no appreciable disturbance. Amongst the causes by which compression of the brain may be produced, we must mention 1st, extravasations of blood, (*a*) between the dura mater and bone, (*b*) into the arachnoid sac, (*c*) into the cerebral substance; 2nd, inflammatory effusions,—whether serum or pus, into any of the three situations just mentioned; 3rd, the growth of tumours; 4th, the depression of large portions of bone.

Respecting the last of these I would venture to assert that it is very rarely indeed the cause of symptoms. The portion of bone depressed must be very large indeed, which could cause symptoms of compression. In ordinary cases the extent to which the cranial cavity is diminished by a depressed fracture is very trivial, as any one may convince himself who has opportunities for examining such skulls from within before the fragments of bone or the dura mater have been disturbed. In all the cases of extensive depression which I have seen, the so-called symptoms of compression were wholly absent. Cases of severe fracture with depression are almost always attended by laceration as well, and the symptoms of the latter lesion have, I feel convinced, been often mistaken for those of compression.

[Here follows a series of most interesting cases, to which are appended the following concluding remarks]:

You will have gathered from the cases which we have narrated that the diagnosis of compression is full of difficulty. On the one hand, compression is frequently suspected when it is not present, and on the other, it is sometimes overlooked when really there. In surgical practice we have to be prepared for it under several different conditions, to say nothing, for the present, of certain others, perhaps more common, which chiefly concern the physician. *First*, we have the cases in which it comes on from effusion

of blood between the dura mater and bone, after injury to the head; *second*, those in which it results from extravasation into the arachnoid sac; *third*, those from abscess between the dura mater and bone; and *fourth*, those from inflammatory effusions within the arachnoid or into the brain substance.

I will take these *seriatim;* and first, those from *Effusion of blood between bone and dura mater.* These are especially important, because generally supposed to be capable of relief by treatment. Yet it is a remarkable fact that the modern annals of surgery do not, as far as I am aware, contain any cases in which life has been saved by trephining for this state of things. I suppose the fact is, that death usually occurs too quickly and too suddenly to permit either of diagnosis or treatment. The symptoms of compression are not present at first; the patient is merely confused, as if from slight concussion, and when more urgent conditions supervene, he dies very quickly. The symptoms preceding death are not, as we have seen in several very definite cases, those which have formerly been held to denote compression. The patient, it is true, becomes insensible; but he is pale, with dilated pupils, a rapid, feeble pulse, and irregular respiration. The "stertor" is only present at times, the countenance is not "bloated," and the pulse is far from "laboured." As for the relaxation of sphincters, &c., there is no time for such symptoms to show themselves, for the patient will probably be dead in an hour. Sometimes the condition comes on, as it were, by two steps, there being two separate effusions of blood. The first makes the patient heavy and stupid, and, it may be, causes a temporary and incomplete hemiplegia, the second kills him quickly. The more carefully we study this group of cases, the higher value shall we be inclined to put upon the previous history of the case as a means of diagnosis, and the less shall we rely on the symptoms. The importance of an interval of immunity between the accident and the occurrence of symptoms has been long recognised as the chief indication of a ruptured meningeal artery; and it is to this, almost exclusively, that we must still give attention, if we wish to diagnose these cases. Unfortunately, it is not always that we can get correct statements as to the early symptoms; but whenever there is clear testimony as to complete immunity at first, and the symptoms have come on suddenly, and at too early a period for the development of inflammation, then we may, with tolerable confidence, infer the existence of hemorrhage. The period at which the hemorrhage occurs may vary in these cases, just as it may after wound of an artery in one of the limbs. It is rarely profuse enough at first to cause symptoms. It may increase in the course of a few hours, or it may burst out suddenly, as a sort of secondary hemorrhage, at the end of one or two days afterwards. In rare instances it may even be delayed for a week, just as a wounded artery at the wrist may bleed after a similar interval. When it is sufficient in amount to squeeze the blood out of the vessels of the compressed brain, then symptoms will occur such as we have described in detail in several cases.

Our inferences as to the side on which the blood-clot lies will be helped by observation of the hemiplegia (if it have been present), by the dilatation of one pupil, and the examination of the scalp. The hemiplegia will be on the opposite side; a fixed dilated pupil will, I think, generally be present on the same side, and a puffy swelling in the scalp will often be found directly over the fracture.

Even if a case of this kind have been recognised in time for an operation, our embarrassment does not end here. It is very likely that difficulty might occur in finding and securing the injured part of the vessel, whilst, also, the removal of a blood-clot from the sphenoidal fossa (its usual position) might be no easy matter.

The second group of cases—*those in which the blood is under the dura mater*—may, in rare instances, resemble in every feature those just described. If a large superficial vessel have been injured, it is possible that an interval may occur, and then a large clot be poured out. More usually, however, these cases are complicated by laceration of the brain, and the symptoms of severe concussion are present from the first. The bleeding

usually takes place, not from one large vessel, but from many small ones, and hence it is poured out with much less of compressive force, and ceases much short of the results which a ruptured middle meningeal can produce. The patient may therefore live much longer, remaining throughout insensible, and with the stertor, laboured pulse, and flushed face formerly held to be universal in compression. The marked inequality in size of pupils, which we have noted in the subcranial cases, will rarely be present, nor will hemiplegia usually be marked.

Our third group is a very important one, because, although rare, it is one in which a correct diagnosis would probably lead to a method of treatment which would save the patient's life. We may encounter *large collections of pus between the dura mater and cranium*, either as the consequence of chronic caries (syphilitic), or of injury ("Potts' puffy tumour" cases). When it occurs slowly, intense pain, gradually increasing in spite of treatment, wearing the patient out by loss of rest, but unattended by paralysis of any kind, will probably be the chief symptom. The increase of effusion will be slow, and the brain will accommodate itself to the pressure. It is possible, however, that special nerve-trunks may be compressed or stretched. Towards the end of the case the patient—emaciated, exsanguined, and reduced to the last degree of weakness—will probably become comatose, the coma being possibly ushered in by convulsions. The cases of abscess between the dura mater and bone, consequent on fracture or contusion of the skull, will be exceedingly difficult to distinguish from those of arachnitis. Arachnitis is infinitely the more common result of such injuries; and you are aware that I have recently asserted and, I think, proved, that hemiplegia is its usual symptom. In these cases there is almost always a little lymph or pus between the bone and membrane, but no collection which you could let out by trephining. If you adopt the rule of trephining in all cases in which, after bruise or fracture of the skull, the patient has become hemiplegic or comatose, with inflammatory symptoms, you will operate in twenty cases of arachnitis for one in which you will find any considerable collection external to the dura mater. Nor is it, as far as I can see, possible to assign any symptoms which will materially help in the differential diagnosis. The more definite the hemiplegia may have been, and the longer the time during which it has preceded the coma, the less likely is it that there is pressure, and the more probable is the diagnosis of arachnitis. If the patient have had rigors of a definite character, the diagnosis of osteitis, thrombosis, and pyæmia may be given, and whatever the position of the inflammatory effusion, your operation will be bootless.

If the diagnosis of compression from abscess between bone and membranes, after injury to the skull, be difficult, that of *compression from arachnoid effusion, or from abscess in the brain*, is yet more so. Indeed, if it be true (as I believe) that the contact of inflammatory secretions with the surface of the hemisphere, without mechanical compression, may induce hemiplegia, it is clearly impossible to tell whether the latter condition is superadded or not. Nor is this diagnosis of much importance in practice. The symptoms which result from abscess in the substance of the brain vary so much in different cases, that it is impossible to be precise in regard to them. Incomplete hemiplegia of the opposite limbs, with attacks of spasms, with headache, and later on, tendency to coma, are probably the chief. Should these symptoms follow a known punctured wound of the brain, trephining and perforation of the membranes and brain may be justifiable.

You will have noticed that I have said nothing as to depressed bone as a cause of compression. I have omitted it, because really I have nothing clinical to tell you about it. I have never seen a case in which there seemed definite reason to think that depression produced symptoms. Where the depression is very great, and the fragment very large, it is possible that symptoms may be caused, but I have not myself seen a well-marked case. That our common cases of depressed fracture should be attended with symptoms of compression it is absurd to expect. The fragments rarely intrude into the cranial cavity sufficiently to displace more than a few

drachms of fluid, and probably a displacement of not less than two to four ounces is required for compression. I have, of course, seen plenty of cases of depressed fractures with head symptoms; but in all, the symptoms were those of severe concussion, or of lacerated brain, and not those of compression. The practice of trephining and elevation is, I think, strongly to be recommended in all cases of compound fracture with depression; but it is in order to prevent inflammatory symptoms, not to relieve an imaginary state of compression of the brain.—*Clinical Lectures and Reports of the London Hospital*, 1867-8, *p.* 10.

15.—ON DELIRIUM TREMENS.

By Dr. Samuel Wilks, Physician to, and Lecturer on the Practice of Medicine at, Guy's Hospital.

Now, after speaking of the slow destruction of the brain-tissue by a chronic inflammatory process, let us look at the case of a more simple atrophy. In the disease we have just left—the general paralysis of the insane—there is not only loss of bodily and mental power, but the manifestations of the latter are peculiar. In simple wasting of the brain, however, there appears to be only a gradual failing of the physical and intellectual functions. See a man, for example, tottering along, scarcely able to support himself, or "all of a tremble," and his mind at the same time impaired; that man, if the symptoms have existed for any period, has an atrophic brain. This may have been the result of age, and he may be approaching a second childishness or mere oblivion; but if he be a young man, it arises from disease, and in all probability, from intemperance. Certainly one of the causes most frequently instrumental in the production of an atrophy of the brain is drunkenness or the excessive use of alcoholic drinks. Alcohol, as you know, causes a degeneration of all the tissues of the body. By its direct effect on particular organs, you may find an increase of the connective or fibrous tissues, and then a cirrhosis of the liver, a Bright's kidney, or a so-called chronic pneumonia may arise; in other instances a fatty degeneration of the tissues occurs, and thus death by diseased heart is very frequent in the drunkard. These two morbid processes are, however, often combined; but, whatever may be the exact pathological change, the result is the decay of all the tissues and organs of the body. It is remarkable how many morbid processes resemble those which naturally take place in advancing age, and thus a disease will by its effects, add so many years to a person's life. A drunken man is literally living too fast.

There are of course other circumstances which tend to this general and nervous decay; but I think in most instances, as you have often heard me say, if you see a man come staggering in amongst our out-patients, the probability is that he has been taking too many so-called "strengthening things" all his life. If you find this so, and he is bodily and mentally incapacitated, that man has assuredly an atrophied brain. If you examine the body of a man who has died of delirium tremens, you find the effects of the long-continued stimulus on his organs; and, as regards his brain, that has a very striking appearance—the membranes are thickened, and the convolutions are much shrunken, so that there are deep sulci on the surface, and in these a quantity of fluid. Sometimes three or four ounces of serum are seen, taking the place of so much good brain which has disappeared. The figurative expression which Cassio makes use of when speaking to Iago contains a solid and substantial fact—"O God! that men should put an enemy in their mouth to steal away their brains!" The brain, then, of a confirmed drunkard is an organ which is shrunken, and weighs so many ounces less than it did when healthy. All its functions, also, are becoming enfeebled, and those qualifications which should have preserved to its owner the name of lord of the creation have disappeared, and he has become, in common parlance, a good-natured fool. Call such a man a brainless sot, and you have his exact condition—the sot implying a man stupid with drink, and the "brainless" imparting to the term his true pathological condition. It

is such a brain as I have mentioned that you find in those who have died of delirium tremens. The earlier attacks of the drunkard are recovered from; but there comes a time when the last and fatal one arises. But then his death is really due to the degeneration of tissues which long-continued habits of intemperance have entailed.

Take a man who, from his addiction to alcoholic drinks, has the weakened brain that I have described, and let any unusual stimulus act upon it, he loses his balance, and he is thrown into the state known as delirium tremens. This is my idea of the disease. I believe some medical books state that delirium tremens is a train of morbid phenomena produced by the slow and cumulative action of alcohol. This, however, I cannot admit without some modification, for it might imply that delirium tremens was due directly to stimulation of the brain. There is, no doubt, a morbid condition set up by alcohol, but this would be *delirium é potu*, or simply intoxication, or poisoning by spirit. I believe, however, that such an opinion as I have mentioned does largely prevail—*i. e.*, that the brain is over-stimulated by the artificial excitement, and that a sudden deprivation of this starts the disease into life. My own strong conviction is, that such an opinion is highly erroneous, as well as the treatment which it necessarily involves—viz., that the stimulus must be restored, and the excitement abated by opium. I believe firmly that such opinion and the conclusions which flow from it are erroneous and mischievous.

My own idea is that the brain has been previously brought into an impoverished state by the continued debauchery, and that, thus weakened, it is ready to be further disturbed by any fresh excitant, whether this be a mental trouble, an accident, or, more probably, an extra amount of the alcoholic stimulus. I am led to this opinion because, in the intervals of the attacks of delirium tremens, the patients present the symptoms I have before mentioned, a mental and physical weakness as a result of the chronic pernicious effects which are being produced on the brain, and also because I observe the circumstances which excite the attack. The cause may be an accident or an acute disease suddenly set up, but more generally we find that the patient has been out with his friends drinking for two or three days in succession, and if he has had any troubles in business this would only be a still further excitant cause. On the other hand, I never hear of a man suffering delirium tremens from having got drunk only once, nor do I hear of it in the habitual drunkard from his having left off the accustomed stimulus. I have never witnessed such a case myself, and I have taken the trouble of inquiring of those who have had an opportunity of seeing persons habitually intemperate, and who have been placed on a bread-and-water diet, and I am informed that such persons do not have delirium tremens. I have myself on several occasions recommended or insisted upon the withdrawal of ale, wine, and spirits from those who had been endeavouring to live upon these stimulants, but never witnessed anything like delirium tremens result. Why I insist more especially upon the importance of having a true conception of the disease is that an erroneous one carries with it a very harmful treatment. The one theory suggests a continuance of the accustomed stimulus; the other its withdrawal and repose for the excited and wearied brain. Delirium tremens is not so simple a disorder as you may imagine; each case requires a study and its appropriate remedies.

Having given you a clue to its pathology and treatment, I have said all that is important. As regards the symptoms several very graphic accounts have been written, and some by those who have suffered all its horrors. I might say in a few words that a man suffering from delirium tremens has generally already shown symptoms of a weakened brain by his tremor and want of mental vigour. When you are called to see him in the attack, you generally at once see the nature of the case; he is probably up and dressed; he may indeed be attempting to conduct his usual business—in fact, he generally has a great desire to be about his accustomed avocations; he is constantly moving and wanting to go somewhere or do something which his friends are as constantly desirous of preventing. As you speak to him he is suffi-

ciently intelligent to know you and sit down for a moment and converse, but it is only for a moment; his restlessness prevents him remaining quiet, and his mind then rambles on all kinds of subjects. If you place him in bed, he constantly jumps up, and is suspicious of those around him, or fancies that he sees objects in the corners of the room; if the bed be surrounded by a screen, then he sees imaginary cats and dogs on the bedclothes, and will attempt to stroke them, or sees creeping things like spiders; or he stretches out of bed to look beneath, fearing there are persons hidden there. All this time he is constantly fidgetting his hands, and perpetually jumping up and lying down again; his pulse is quick, his tongue is furred, and he is bathed in perspiration.

When I say such a case is easily recognised, I mean with care, for I have constantly seen mistakes made with reference to diagnosis. I have seen general paralysis of the insane styled delirium tremens by the same physician on two different occasions. In the surgical ward of a hospital, cases of injury to the head, followed by arachnitis, or effusion of blood on the surface of the brain, are extremely likely to be called by this name. Acute disease, as pneumonia, occurring in a person of intemperate habits, is masked by the delirium, and the primary disease may be overlooked. Typhus fever I have seen styled delirium tremens; and there is one disease which certainly puts on an outward form very like it—I allude to the case where cerebral symptoms accompany pericarditis. A patient, for example, has acute rheumatism, followed by inflammation of the heart, and, in some cases, most remarkable nervous symptoms ensue—the patient is delirious, is in constant movement, and bathed in perspiration—he resembles exactly, indeed, the case of delirium tremens. In this case the stethoscope placed over the heart would insure to the listener a true knowledge of its nature,

It is important also to know what is the condition of the patient generally who suffers from delirium tremens, for on the state of the organs the prognosis mainly depends. He may have cirrhosis of the liver, or, what is not uncommon, Bright's disease of the kidney. If the patient have convulsions, you may find that the urine is albuminous, and this of course must endanger the case. Convulsions, I might say, however, often occur independently: they may be due to the wasted brain, or be temporary and due to the recent debauch.

Now, as regards treatment, the most important instruction I can give you is what *not* to do. Do not, in the first place, regard delirum tremens as a disease due to the sudden withdrawal of an accustomed stimulus, and therefore commence the treatment with the administration of wine or spirits—you will by so doing add fuel to the fire—but look upon the attack as due to excitement acting on a previously weakened brain. Then your mode of treatment is obvious and rational. In one word, get your patient repose. Now I do not mean by this that your remedy is simply opium to procure sleep, but I use repose in a much larger sense. I have frequently seen a patient, probably a publican, sitting in a large room surrounded by a dozen friends, male and female, who are talking to him or holding him in restraint. He is bathed in perspiration, his pulse is very quick and feeble; the doctor says he has not slept for two or three nights, and he dare not give any more opium, as the pupils are already contracted. His fears that the man will die seem not ill-grounded, since it is impossible to suppose that any mortal man could go to sleep under such circumstances. I have seen such a patient then removed to a small room, put to bed, and go off to sleep in half an hour. Therefore I say that the most judicious treatment is required for delirium tremens, and do not go away with the notion that all you have to do is to give opium to procure sleep. I have many times seen the last sleep produced by it. And do not, as I before said, continually give stimulants to "keep up" the patient, for I have constantly seen the complaint strengthened by these means. I do not wish to reflect on the opinion of others, because I state strongly my impression that the disease is not to be cured off hand by medicine. I see a great deal of this disease, and the time at which I am called in is about the third day, when, all means have been found unavailing in checking the com-

plaint, another opinion is sought; after this time the patient usually sleeps and does well. I think then, except in very slight cases where a single dose of opium procures rest, that a certain interval must elapse before the commotion subsides; that in a bad example of the complaint the symptoms will continue without abatement for three days at least. This is my experience under all modes of treatment. I have no objection to opium, but it must be administered judiciously; if you act on the principle that sleep must be procured at all hazards and as soon as possible, you will without doubt kill many of your patients. In the first instance you should place your patient in a small quiet room, and get rid of a number of officious friends.

As regards medicines, you must be guided by circumstances. I have often prescribed with advantage the well-known mixture of twenty drops of antimony wine and tincture of opium every four hours, keeping up the patient's strength by beef-tea. If you can give a glass of wine or beer in the form of nourishment without its producing any injurious stimulating effects, I have no objection; but, as a rule, I advocate the plan of giving none. Instead of administering antimony, you might give the laudanum, or small doses of morphia with ether or ammonia, and, at the same time, support the strength of the patient. By judicious management of this kind you will find your patient recover in three or four days, unless, indeed, he be extremely diseased in consequence of his former dissipations. As regards restraint, I have often heard objections made to it, but I believe it is often necessary, and its adoption is a real kindness to the patient. He may wander about his house until he drops dead from exhaustion, when a forcible restraint in bed by a sheet across the chest might procure rest for the body, and often for the brain. Remember, then, your patient wants repose; do not be content with administering opium and neglecting every measure which common sense would say was necessary to give any man a night's rest. As regards chloroform, you may quiet the patient by it for a time, but you do not in any way influence the disease. Other remedies are advocated. When digitalis was first proposed, I gave it to a man in large doses, and, he having unfortunately died, I have never felt myself justified in administering it again. I have seen enough of the sedative effects of the wet sheet to fully believe the statements which have been made as to its efficacy. You strip the patient naked, roll around him a wet sheet until he looks like a mummy, then a blanket around this again. In many cases of delirious excitement, you will find that, as soon as a hot vapour surrounds the patient, he sinks into a quiet sleep.—*Med. Times and Gazette, Sept.* 19, 1868, *p.* 327.

16.—FARADISATION IN THE TREATMENT OF PARALYSIS.

By J. Netten Radcliffe, Esq., Medical Superintendent of the National Hospital for the Paralysed and Epileptic.

[Of the three forms of electricity used in medicine, viz., frictional, chemical, and induced, the nomenclature has given rise to a good deal of discussion.]

It seems to me that it would be an advantage to have a series of terms which, while securing the object which Duchenne had in view, would be free from the objections referred to. The electricity of chemical action is more correctly and generally designated, after the name of the original discoverer, Volta, *voltaic* electricity. Faraday suggested that frictional electricity should be termed after the illustrious philosopher, Franklin, whose name is especially connected with its early experimental study, *franklinic electricity*, and the name is now being widely adopted by physicists. By applying the method of terminology which Duchenne has so happily used in respect of the induced current to the other forms of electricity, a series of terms is obtained which would be accurate in form as the practice of nomenclature goes, true to science in fact, free from confusion, and particularly convenient in usage. The series would be, (1) *faradaic electricity*, or *faradism*, and, as respects the pathological and therapeutical application of the agency, *faradisation*: (2) *voltaic electricity* or *voltaism*; *voltaisation*: (3) *franklinic electricity* or *franklinism*; *franklinisation*.

Faradisation —A faradaic apparatus, of one kind or another, when the diagnostic and therapeutic value of faradisation are more widely understood, will become as necessary a part of the practitioner's armament as a stethoscope, or an ophthalmoscope, an otoscope, or a laryngoscope. By the aid of such an apparatus certain special peculiarities of several forms of paralysis, a knowledge of which is essential to the proper treatment of the diseased state, can alone be detected. To the right use of faradisation it is necessary that an instrument should possess certain fundamental requisites. These are:—a sufficient range of power, so as to bring at once, and when properly applied, the largest muscles into full and energetic contraction; easiness and a certain niceness of graduation; and immediate readiness for action, and capability of being placed out of action without involving trouble and loss of time. The form of apparatus which is excited by a permanent magnet (*magneto-faradaic*), possesses the first and last of these requisites, but, except in the more elaborate instruments, is deficient in the second; but the facility of use of a magneto-faradaic apparatus is greatly impeded by the need of a second person to work it. The form of apparatus which is excited by a voltaic cell (*volta-faradaic*), as ordinarily made, possesses the first and second of the requisites named, but is seriously defective in the third. A volta-faradaic apparatus has, however, been constructed by Stöhrer, of Dresden, which possesses to the fullest extent even the last-named requisite, and which is unquestionably the best and most efficient apparatus for medical purposes yet constructed. This apparatus possesses not only the fundamental requisites which have been enumerated, but also the principal refinements which give an apparatus additional value.

The chief peculiarity of Stöhrer's volta-faradaic, or, as he terms it, induction apparatus, consists in the arrangement of the cell. The elements are formed by a hollow cylinder of carbon, surrounded by a cylinder of amalgamated zinc. The hollow of the carbon is partly filled with fine glass sand, charged with from fifteen to twenty drops of a saturated solution of chromic acid. Both elements dip into a glass jar containing diluted sulphuric acid (one part of the acid to six of water). This jar is moveable, and it can be raised so as to immerse the elements or dropped so as to leave them free from the acid. By this ingenious arrangement, the apparatus can be brought into or put out of action at a moment's notice; and there is this that is remarkable about the combination of elements, that even with frequent daily use they retain their power, and act well for from six to eight weeks, and with care for even a longer period. Moreover when the action is exhausted, the re-amalgamation of the zinc and re-charging of the cells are barely a quarter of an hour's work. The induction coils do not differ from those of other well-made volta-faradaic apparatus, except in the mode of packing, and certain elaborations of accessories. Stöhrer makes two kinds of volta-faradaic apparatus, a larger and smaller. Both are excellent instruments, and both are portable, but the larger is by far the best and most complete.

The currents derived from both the magneto-faradaic and volta-faradaic apparatus produce the same physiological effects when transmitted through a part of the human frame. They equally excite the sensitiveness of the sensitive nerves lying in their track, as shown by pain or other modifications of sensation, and bring into action the contractility of the muscles. These physiological phenomena lie at the root of the therapeutical uses of faradisation, and medicine is indebted to Duchenne (de Boulogne) for first showing in what manner they may be best elicited and applied in the treatment of disease. He has shown that when metallic conductors are used, according as they are applied to the surface of the body uncovered and dry, or tipped with layers of moistened leather or sponge, the electrical current may be limited to the skin and tissues immediately subjacent, or made to pass to the deeper-seated structures, and localised in definite muscles or groups of muscles. This constitutes what Duchenne has termed *localised electrisation*. By this method it is practicable to determine easily and accurately, in the living, healthy subject, the action of the different muscles which can be reached by the electrical current; and this is what Duchenne has done in

his two remarkable works, "Mécanisme de la Physionomie Humaine" (Paris: 1862), and "Physiologie des Mouvements" (Paris: 1867). By this method the state of motility of paralysed muscle can alone be determined in reference to the therapeutical application of electricity, and that application effectively carried out.

As regards the muscles, the method may be employed either *directly* or *indirectly*, that is to say, in the former case by applying the conductors directly over the belly of the muscle; in the latter, by acting upon its motor nerve when accessible. The direct method is that chiefly followed by Duchenne. He uses as conductors (or rather directors) instruments of various forms. These include a pair of sponge-holders for directing the current upon the larger muscles; a pair of button-headed directors covered with several layers of leather for localising the currents on smaller muscles; and an olive-shaped and a conical director, the heads also sheathed with leather, for localising the currents on the individual muscles of the face. In addition, he uses a brush of fine wire for localising the current in the skin. The form of the handles is such as to permit each pair of directors being manipulated by one hand so as to leave the other free. The directors are connected with the volta-faradaic apparatus by very flexible wires covered with silk, or cotton, or india rubber. Before being used, the sponges or leather coverings are saturated with warm water in which a little salt has been dissolved. For therapeutical purposes, each muscle, or group of muscles, should be acted upon for about thirty seconds at a time, with intervals of a few seconds, and the whole period of application should extend from ten to twenty minutes as a rule.

The *therapeutical uses* of faradisation arise directly out of the physiological properties of faradaic currents. In respect of the muscular system they rest entirely upon the power possessed by these currents of exciting muscular contraction, and the physiological consequences of such contraction, namely, increased growth and aptitude to action of the muscular tissue. The reaction of muscles against a faradaic current—the *electro-motility* so called—is unaffected, or it is variously modified in certain paralytic affections. When the electro-motility is normal, as in paralysis of cerebral origin, faradisation cannot make the contractility of the muscles more normal; and, as a rule, it is useless. When the electro-motility is diminished or exhausted, as in certain forms of spinal and local paralysis, faradisation may reinvigorate or recall the defective or lost motility. The broad rule for the application of faradisation in the treatment of paralysed muscles is, indeed, this:—*when the electro-motility is diminished or exhausted, then faradisation will be of service; when the electro-motility is unaffected it will not prove of any use.* The question then, of the use or not of faradisation in a given case of paralysis, involves a primary question of diagnosis; and this diagnosis is altogether special, and can be determined only by the systematic examination of the affected muscles. Such an examination excepting only in the ordinary forms of paralysis of cerebral origin, should be made in every case. The examination, however, it is to be repeated, must be of individual muscles, for in the forms of paralysis in which faradisation proves most beneficial, not all the muscles of an affected limb may be equally paralysed, and some may be unaffected while the motility of others is seriously damaged. To faradise equally the affected and the unaffected muscles—those muscles which are slightly and those which are much injured,—would be to do harm rather than good, and at the best would be a haphazard practice. The condition of muscle in which faradisation is found chiefly beneficial most commonly exists in paralysis following certain lesions of the substance of the spinal cord, the paralysis of infancy, and local palsies arising from injury of a nerve, or which are classed as rheumatic palsies. If, however, the practitioner follows the rule of guidance given above, he will have no difficulty in any given case of determining whether faradisation is needed or not in its treatment. The chief caution to be borne in mind is that in cases of centric origin *faradisation should not be had recourse to—or, indeed, any method of electrisation—so long as active mischief exists.*

"A frog was selected of the same weight as the last, and in every other respect as nearly resembling it as possible, and a small drop of solution of strychnia (Brit. Pharm.) was placed on its back. Tetanus occurred in four minutes; and violent convulsions of a tetanic character followed each other at intervals, and could be excited by the slightest touch, during the next six hours, after which the observations were stopped."

In addition to this paralysing action on the spinal chord, physostigma diminishes and even destroys the conductivity of motor nerves. It thus includes among its therapeutic properties that which has recommended curare as a remedy for tetanus. It is, therefore, peculiarly suited to counteract such convulsive movements as results from an exaggeration of the reflex function of the spinal system. It is true, that it does not influence the afferent, or sensory, nerves, and probably its value would be enhanced if it diminished the activity of these. This effect might especially be valuable in such cases of tetanus as manifestly depend on an irritation of peripheral nerves. But there can be little doubt, that in these the primary irritation constitutes but a portion of the disease. The symptoms prove undoubtedly that the spinal chord is sooner or later affected. Tetanic convulsions or exacerbations of existing convulsions may be produced by sudden sounds, by unexpected sights, or by gentle touches of any portion of the skin, proving the existence of an abnormally excitable condition of the reflex centres, the result, possibly, but now independent, of persistent irritation localised in an injured afferent nerve. It cannot be ignored, however, that a persistent local irritation may occupy a position of such importance in the disease as either to interfere greatly with the prospects of successful treatment by such a remedy as physostigma, or altogether to prevent success. Several cases have been recorded where tetanus has followed injuries and surgical operations, and where important nerve lesions have afterwards unmistakeably indicated its cause. No great benefit can rationally be looked for in these cases from the employment of any drug. A necessary preliminary must always be the discovery of the lesions and their removal by surgical means

Shortly after the recommendation of physostigma as a remedy for tetanus, a French practitioner, M. Lemaire, employed it in a case of the spontaneous or idiopathic variety of the disease. This was in 1864. It appears to have been the first example of this treatment, and was fortunately a successful one. In the same year, M. Giraldès the accomplished surgeon of *l'Hôpital des Enfants* at Paris, narrated before the Surgical Society a case in which he had successfully used physostigma in tetanus. About two years after this, the value of physostigma in tetanus was successfully tested, for the first time in this country, by Dr. Eben Watson, of Glasgow,—a gentlemen who deserves great credit for the ability with which he has investigated some of the physiological effects of this drug, and for the energy and skill with which he has advocated its application to the treatment of tetanus. Other nine cases have since been recorded.

[Dr. Fraser then relates twelve cases in which physostigma was used. Of these one was too far advanced before the treatment was commenced, but of the remaining eleven, nine recovered.]

Dr. Bouchut's case is one that shows the urgent necessity of commencing the administration of this drug as early as possible, and of boldly increasing the dose until some decided effect is produced. Physiological chemistry teaches us that muscle itself produces, during its contraction, substances that cause it to contract. When the contraction is extremely energetic and continuous, these substances so accumulate as to cause a condition of persistent tetanus, independent of the nervous system for its persistence. Possibly the continuous rigor, especially marked in the muscles of the back, and occasionally described, in fatal cases, as passing directly into the condition of *rigor mortis*, may be greatly due to this circumstance. Our knowledge of this disease teaches us that the abnormally excitable condition of the reflex centres first manifests itself in limited portions, and gradually extends until it involves their whole extent. It is, therefore, of the greatest importance to diminish the frequency of the tetanic convulsions at as early a stage as possible. This,

it is only rational to suppose, will be best done by the use of a substance that diminishes the reflex excitability of the spinal chord. Physostigma possesses such an action, and the experience gained in these cases proves that it efficiently exerts it in tetanus. I extract, in illustration, the following details from the account of Mr. Ashdown's case (Case 9):—

"October 6th.—. . . One-third of a grain of extract of Calabar bean, dissolved in eighteen minims of water, ordered to be injected every two hours under the skin. The effect of the first subcutaneous injection was very marked. In about five minutes, the legs, which had been previously perfectly rigid and immoveable, became flaccid and freely moveable by the patient; the abdominal muscles became less tense, and the arching of the spine disappeared. The pupils also contracted, and the pulse sank to 82. The effects lasted two or three hours, and all the symptoms then reappeared." . . .

"October 7th.—. . . Every subcutaneous injection, which had been given regularly every three hours during the night, had been followed by an almost complete remission of the symptoms, lasting about two hours. . . .

"October 10th.—During the night, as the patient was very delirious, and the pulse had risen to 148,—effects supposed to depend on an overdose of the medicine,—the injections were stopped for seven hours. This morning, the vessels were as rigid as ever; and the paroxysms, which had almost ceased, again increased in frequency. The injection was ordered to be continued as before. In the evening, the pulse had fallen to 125, but the injections had been required every two hours, the effect not lasting so long as previously."

In the cases I have mentioned, physostigma was administered in very varying doses, and in numerous forms. Little benefit would, therefore, be derived from an attempt to establish any rules for its administration from the experience of these cases alone. I prefer to use this experience as merely a guide in preparing the recommendations I venture to make on the employment of this remedy in tetanus.

The British Pharmacopœia contains two preparations of physostigma, the powder and the extract. I think the powder should not be used, as there is considerable evidence to show that the functions of the stomach are impaired in this disease. By giving it we not only increase this evil, but we fail, on account of the comparatively slow action of the powder, in securing the important object of affecting the system as rapidly as possible. The extract should be always used, as it is the most concentrated preparation, and one on whose constancy we may rely. It may be given in the form of pill, or of solution and suspension in water (mixture), or of solution in weak spirit of sp. gr. 0·920 (thirty-two grains to the fluid ounce). I prefer the first and last of these forms, as that with water decomposes in a few days.

Physostigma may be administered by the mouth, anus, or subcutaneously; and the special peculiarities of each case will be the best guide in determining which of these should be used. I should myself feel inclined always to commence the treatment by subcutaneous injection, to repeat such injection until the system is decidedly affected, and then to administer the remedy by the mouth, in a dose three times as large as is found necessary by subcutaneous injection. Such a plan might be quite safely followed in a child of even nine years. If the remedial effects continue to be produced by administration by the mouth, it should be persevered with, for such administration has obvious advantages as far as the convenience of the practitioner is concerned. In the more severe cases, however, I believe subcutaneous injection should be alone employed. The distress and the increase of spasm caused by swallowing, or the impossibility of introducing substances by the mouth, will render this necessary. I cannot, also, urge too strongly that subcutaneous injection should always be used when severe and continuous spasms occur, when a fatal result is imminent from the exhaustion caused by prolonged and frequent convulsions, and when apnœa threatens at once to close the tragic scene. By it we obtain the quickest and most powerful effects. Administration by the anus will be rarely necessary. It may, however, be employed to relieve the stomach, and will then be occasionally useful.

From the preceding remarks, it cannot be expected that any arbitrary rules of dosage can be laid down. For an adult, one grain of the extract by stomach, or one-third of a grain by subcutaneous injection will be generally sufficient to commence with. This should be repeated in two hours, when its effects will usually have passed off, and the succeeding doses may be modified according to the experience that will thus be gained. When used by subcutaneous injection, the dose of extract should be carefully mixed with ten or fifteen minims of water. This mixture has always an acid reaction which is sometimes so decided as to produce slight irritation of the cellular tissue; but this can be avoided by carefully neutralizing the mixture with a solution of carbonate of soda. Suppositories, made with oil of theobroma and white wax, may be employed when administration by the anus is desired. Each of these should contain two grains of extract. For children, we must be guided by the general rule of employing, according to age, one-third or one-fourth, or even less, of the above doses. It will be found necessary to repeat these doses frequently—every hour, every hour-and-a-half, or every two or three hours—and, of course, the severity of the disease and the effect of the remedy will be the best indications for this. The great object is to produce as quickly as possible, and then to maintain, the physiological effect of physostigma in diminishing reflex excitability. The doses must, therefore, be continued in increasing quantities until this physiological effect is produced, or until the sedative action of the drug on the circulation is carried to a dangerous extreme, or until constant nausea and vomiting compel us to desist.

This nausea is, I believe, due to the action of physostigma in causing energetic contractions of the stomach and intestines. To this cause may also be referred a peculiar epigastric sensation, which is one of the first symptoms of the action of this drug, whether it be administered by the stomach or subcutaneously, and which is always relieved by eructation. The catharsis that physostigma causes—probably an advantageous effect in tetanus—is another result of this intestinal contraction, though it is also due to an increase of secretion by the intestinal glands.

Another physiological effect of physostigma is excessive perspiration. This is most strikingly observed when a large dose is administered by subcutaneous injection. It may be of some importance in the treatment of tetanus, for sudorifics are vaunted as reliable remedies for this disease; but, as I am at a loss to understand why perspiration should in itself prove beneficial, I mention it only as an indication that physostigma is affecting the system.

It might reasonably be expected that the active principle of physostigma —eseria—should be valuable in tetanus, and especially for administration by subcutaneous injection. It is, however, an alkaloid that is very difficult to prepare, and, as far as my knowledge of its properties is concerned, it appears to be somewhat unstable. There is, besides, but little advantage in employing a more active remedy than the extract of physostigma.

In these observations, no distinction has been drawn between the traumatic and idiopathic varieties of tetanus. As far as treatment is concerned, they only differ in this, that the traumatic variety is usually the more severe and acute, and that it, therefore, generally demands a very energetic and active employment of the remedy.

I have avoided all discussion of subsidiary measures, as these are not included in the subject of the present communication.

Chorea.—As the principal indications for the therapeutic use of physostigma have been already mentioned, its employment in chorea may be very briefly considered. Dr. George Harley was, I believe, the first to use physostigma in this disease. His case occurred at the end of 1863, and was a successful one. Since then, three successful cases have been published by Dr. John Ogle; and I have seen others in which successful results were attributable, in great measure, to the use of this drug.

The disease is one of such protean form, that it is impossible to advise the use of one remedy for all cases. It must, however, be admitted that in the great majority of cases involuntary contractions occur of such a char-

acter as to demonstrate an exaggerated condition of the reflex motor function of the cord. The want of co-ordination in the movements by which this disease is characterised, is dependent, not only on imperfect voluntary contractions, but also—and sometimes in great degree—on involuntary contractions. The latter are obviously the results of either a stimulus supplied by the exercise of volition, or of one supplied by the voluntary movements themselves, acting through afferent nerves on an abnormally excitable condition of the reflex centres. We have seen that the action of physostigma is to diminish such a condition.

The treatment of this disease will rarely require to be so active or energetic as that recommended for tetanus. Physostigma should be administered either in the form of powder or of tincture. From three to six grains of powder, thrice or four times daily, may be given to children, and from ten to twenty grains, as frequently, to adults. The Pharmacopœia does not contain a tincture, but a formula for an efficient and sufficiently active one has been published. It may be given to children in doses of from five to fifteen minims, and to adults of from twenty to thirty minims.

However promising the treatment of chorea by physostigma may appear, the experience we yet possess is much too limited to allow us to arrive at any decided opinion as to its value.—*Practitioner*, *Aug.* 1868, *p.* 76.

19.—A CASE OF ACUTE TRAUMATIC TETANUS TREATED SUCCESSFULLY WITH EXTRACT OF CALABAR BEAN.

Under the care of Mr. Ashdown, at the Northampton General Infirmary.

[The patient, 33 years of age, was a labourer, who had received a wound half an inch in length on the scalp and a second on the left ear from a fall off a coal stack. A fortnight after this the first symptoms of tetanus appeared.]

On admission (October 3rd), the tetanic aspect was strongly marked. The forehead was permanently wrinkled, and the angles of the mouth retracted. The teeth could be separated about half an inch. The respiration was quick, and chiefly thoracic; the abdominal muscles were tense and unyielding to pressure; the back was arched, and its muscles rigid; as also were those of the legs, the arms alone being freely moveable. The skin was bathed in perspiration; and the chief complaint was in pain at the pit of the stomach. There was a slight appearance of suppuration about the wound on the left ear, but that on the scalp cicatrised. The urine was retained. Pulse 114. He was ordered to take one-sixth of a grain of extract of Calabar bean in a drachm of water every half-hour; and to have strong beef-tea, milk, eight ounces of port wine, and four ounces of brandy.

In the evening, the pulse had fallen to 94; but the paroxysms came on every few minutes, and were produced immediately by any disturbance. He had been fed by means of a piece of gutta-percha tubing passed to the back of the tongue and attached to an ordinary feeder, and seemed to have no difficulty in swallowing. His urine was removed by a catheter.

On the 4th, the patient's condition was but little altered, though the pain was not quite so severe, and at times he had been able to move his legs slightly.

On the 5th, after a visit from his friends, he was much worse; violent paroxysms coming on every few minutes, and the muscles appearing even more rigid than previously. The pupils were rather dilated, and freely influenced by light. The dose of the extract was increased to one-third of a grain, and the wine and brandy doubled in amount.

October 6th. He had vomited several times, and was not in the least improved. The medicine was stopped, and one-third of a grain of extract of Calabar bean, dissolved in eighteen minims of water, ordered to be injected every two hours under the skin. The effect of the first subcutaneous injection was very marked. In about five minutes, the legs, which had been previously perfectly rigid and immoveable, became flaccid and freely moveable by the patient; the abdominal muscles became less tense; and the arching

of the spine disappeared. The pupils also contracted, and the pulse sank to 82. The effects lasted between two and three hours, and all the symptoms then reappeared. Beef-tea and brandy enemata were ordered to be used every four hours.

October 7th. The vomiting had been less frequent, but had not entirely ceased. Every subcutaneous injection, which had been given regularly every three hours during the night, had been followed by an almost complete remission of the symptoms, lasting for about two hours. In the evening, each dose was increased to half a grain.

October 8th. He passed a restless night, though he had not been in so much pain, and had for the first time been able to dispense with the aid of the catheter. Vomiting had ceased; and several eggs had been taken, beaten up with wine. The beef-tea and brandy enemata were therefore omitted. Eggs *ad libitum*, and a bottle of sherry daily were ordered. The dose of extract of Calabar bean was increased to three-fourths of a grain in each injection, to be given at intervals of two hours only, or as soon as the effect of the previous injection had passed off.

October 9th. The injections had been continued every two hours, and their influence in preventing the muscular rigidity and spasms remained unabated; the only muscles not perfectly relaxed were those of the abdomen and back. The pupils were much contracted, and the patient had been at times very delirious. He continued to take plenty of nourishment. The urine contained a large quantity of phosphates. As the injections occasioned much pain and inflammation in the cellular tissue, and the solution was found to be acid, a few drops of liquor potassæ were added to it. The solution thus obtained was more perfect, and produced less pain.

October 10th. During the night, as the patient was very delirious, and the pulse had risen to 148—effects supposed to depend on an over-dose of the medicine—the injections were stopped for seven hours. This morning the muscles were as rigid as ever; and the paroxysms, which had almost ceased, again increased in frequency. The injection was ordered to be continued as before. In the evening, the pulse had fallen to 125; but the injections had been required every two hours, the effect not lasting so long as previously.

October 11th. The dose was increased to one grain at similar intervals.

October 12th. One-third of a grain of morphia was ordered to be injected subcutaneously every night with that of Calabar bean; as the latter, notwithstanding its influence in subduing the spasms and rigidity of the muscles, did not secure sleep, and the night had been restless and disturbed.

October 13th. He slept well all night after the morphia injection was given; and this morning there was a marked improvement. The pulse 94; the countenance flaccid, and not expressive of suffering; the muscular rigidity less; and paroxysms infrequent. He took twelve eggs and two bottles of sherry in twenty-four hours.

October 15th. As the skin was becoming tender from the numerous injections, and the severity of the disease was evidently subsiding, they were omitted, and suppositories containing a grain and a quarter of extract of Calabar bean were ordered to be applied every two hours; the morphia to be continued every night.

From this time, the patient gradually improved, the suppositories acting very favourably; but it was not until November 1st that all the rigidity of the muscles had finally and permanently disappeared, and convalescence was established. Up to this time, the suppositories had been continued, though at gradully increasing intervals. A few small subcutaneous abscesses formed at the sites of some of the injections, but they gave little trouble; and he was discharged well on November 30th.

Remarks.—The result of this case—which, though not, perhaps, of the acutest type, was one of very great severity—shows that the plan of treatment adopted is deserving of a more extended trial; for, though the Calabar bean does not appear to exercise any direct curative action in the sense of cutting short the disease, it is impossible to doubt its influence in controlling the more urgent and dangerous symptoms. The superior advantages of the

hypodermic method of administering the extract of Calabar bean were in this case very obvious; for in this way relaxation of the spasmodically contracted muscles was very rapidly and invariably produced, even when the dose was extremely small; while, when administered by the mouth, only a large dose exercised any obvious influence, and its further continuance was contraindicated by the sickness caused by it. It was noted that the extract of Calabar bean, when rubbed up with water, formed a very acid solution; and that the addition of a few drops of liquor potassæ, without interfering with its efficiency, produced a more perfect solution, and one not producing pain at the time of injection, or inflammation in the cellular tissue subsequently.—*British Med. Journal, March* 21, 1868, *p.* 274.

20.—ON THE PATHOLOGY AND TREATMENT OF EPILEPSY.

By Dr. George Johnson, Physician to King's College Hospital.

To what extent do the phenomena of an epileptic fit admit of explanation? In a fully developed epileptic fit, there are two chief phenomena to be explained; these are loss of consciousness and convulsions. The loss of consciousness, until within a very recent period, has generally been supposed to be a result of congestion of the nervous centres, and especially of the cerebrum. But this explanation is inconsistent with the fact, that the epileptic loss of consciousness comes on in a moment at the very commencement of the attack, when there is no evidence of congestion, and when the face is usually pale from anæmia. The congestion follows the loss of consciousness; and the explanation of its occurrence appears to be this. The convulsion implicates the respiratory muscles; the blood, therefore, being imperfectly aërated, is impeded in its passage through the lungs; it consequently accumulates in the right side of the heart and in the veins. The congestion, therefore, is a secondary venous congestion; and, at the time when this congestion has reached its greatest height, there is often a commencing return of consciousness. Obviously, then, this congestion is not the cause of epileptic loss of consciousness. This retrograde venous engorgement is the cause of the ecchymoses beneath the skin and the conjunctiva, which often occur during a fit, and of the hemorrhage into the substance or upon the surface of the brain, which happily is a much less frequent accident.

A number of facts point to the conclusion, *that both the loss of consciousness and the convulsions of epilepsy are the result of sudden and extreme anæmia of the brain.*

In man, and in most, if not in all, warm-blooded animals, a rapid and very copious hemorrhage usually causes convulsions. Kussmaul and Tenner state (*On Epileptic Convulsions from Hemorrhage*, New Sydenham Society, 1859), that, in numerous cases of dogs, cats, and rabbits, they observed, without a single exception, violent and general convulsions preceding death from loss of blood. In order to produce this result, the hemorrhage must be rapid. If it occurs slowly, so that the vital powers are gradually consumed, death then occurs with swooning, drowsiness, and delirium, without convulsions.

The same observers found that an interruption in the supply of blood to the head of a rabbit, by ligature or compression of the arteries, produces epileptic fits as surely as hemorrhage does. In about one hundred rabbits, they ligatured or compressed the carotids and subclavians, from which, be it remembered, the vertebrals proceed, and in every instance except that of one very old, lean, and feeble rabbit, convulsions occurred. In order to produce convulsions, it was necessary to close all the four arteries which supply the brain. If but one carotid or one subclavian remained pervious, the animal was enfeebled and more or less paralysed, but not convulsed. And again, if during the height of a convulsion, the ligature is removed from one carotid, the convulsions generally cease immediately, and there is

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nary embolism is very imperfect; but, in some instances, it has been observed that death was preceded by violent convulsions; and Virchow noted, amongst the results of artificial embolism of the pulmonary artery in animals, convulsions and dilatation of the pupil. (*Des Emboles Pulmonaires.* Par B. Ball, p. 129.)

Again, Blake found that an injection of a solution of soda or its salts into the veins of a dog, destroys life by arresting the flow of blood through the lungs. The left side of the heart is found empty, and the right distended. Death occurs in about forty-five seconds, and is preceded by violent opisthotonos. (*Edinburgh Medical and Surgical Journal*, vol. liv., p. 343.)

Blake attributes the nervous symptoms to the venous pressure on the brain; but they may, with much more reason, be attributed to the arrest of the arterial supply to the brain. When, from any cause, the blood is arrested in its passage through the lungs, it is obvious that distension of the systemic veins must have, as its necessary correlative, comparative emptiness of the systemic arteries; the one will be an index and a measure of the other.

Lastly, we have the convulsions which occur in almost every case of acute apnœa or sudden suffocation. It is generally supposed that the convulsions of apnœa are excited by the circulation of black blood through the brain; but they are more probably due to the rapid and extreme anæmia of the brain consequent upon the impeded transit of blood through the lungs. When the air is excluded from the lungs, the circulation is rapidly arrested by the contraction of the minute pulmonary arteries. That this is the true explanation of the convulsions of apnœa, is rendered highly probable by an observation of Kussmaul and Tenner (*op. cit.* p. 75), to the effect that "the approach of convulsions in strangulation can be accelerated if the arteries are simultaneously compressed." It is obvious that, if the presence of black blood in the brain were the cause of the convulsions, their approach would be retarded, and not accelerated, by compression of the arteries which supply the brain. The facts are consistent only with the theory that the immediate cause of the convulsions in cases of suffocation is a rapidly increasing cerebral anæmia, resulting from the arrest of the pulmonary circulation. Black blood, in so far as it is deficient in oxygen, is equivalent to no blood. Probably it is rather by its negative quality of being unoxygenised, than by any positively noxious properties, that it is unsuited to maintain the functions of the brain. It is probable, too, that the minute cerebral arteries resist the passage of black blood, and so increase the anæmia of the brain. If the circulation of dark blood through the cerebral vessels would excite convulsions, we should expect to find this symptom of common occurrence in cases of emphysema with bronchitis.

I have now referred to instances of epileptiform convulsions occurring under a considerable variety of circumstances, but all agreeing in this one condition, namely, that the convulsions are associated with a defective supply of arterial blood to the brain. Let us now proceed to inquire whether the phenomena of epileptic convulsions, as they ordinarily occur in the human subject, are consistent with the theory of anæmia. It is a matter of general observation that, at the very commencement of an epileptic fit, the face is pallid. There is anæmia of the superficial vessels; and with this there is probably associated anæmia of the intracranial vessels which supply the brain itself. The pallor is in most cases soon succeeded by lividity, owing to venous engorgement consequent upon the impeded respiration and pulmonary circulation. It is very remarkable that, while the face is pallid, the heart and the carotids are beating strongly. It is probable, therefore, that there exists some impediment to the flow of blood through the minute branches of the arteries. To explain this impediment, Kussmaul and Tenner suggest that the minute arteries, both the superficial and the intracranial branches, contract so as to bar the passage of blood. Hence arise the pallor of the face and the epileptic convulsion. In some cases, it is said that the face is more or less livid at the very commencement of the fit. The probable explanation of this is, that the respiratory muscles are convulsed, and there is a consequent venous tur-

a sudden change from the most frightful spasm to complete relaxation of the muscles. The description of the convulsions thus artificially produced in these animals, shows that they were essentially the same as epileptic convulsions in the human subject. There was the dilated pupil, the tonic spasm, quickly succeeded by clonic convulsion, so violent as to throw the animal forcibly forwards to a distance of one or two feet, and sometimes even over the shoulders of the experimenter. These experiments suffice to show the fallacy of the explanation which Dr. Brown Séquard and others have given of the clonic convulsions in man. It has been supposed that the clonic convulsions are a consequence of the circulation of black blood which results from the tonic spasm of the respiratory muscles. Now it is manifest that, in these animals with ligatured arteries, no black blood could reach their brain. In them, therefore, the clonic convulsion, as well as the preceding tonic spasm, must be due to want of blood, and not to the altered quality of blood in the brain.

These experiments obviously cannot be repeated on the human subject; but Drs. Kussmaul and Tenner describe the effects of compressing the carotids in six men. In all, the face turned pale; the pupils first contracted and then dilated; the respiration became slow, deep and sighing; then there was giddiness, staggering, and unconsciousness, and the patients would have fallen had they not been supported. "In two subjects, of weak intellect and moderately anæmic, in whom, notwithstanding the above symptoms, the compression was continued, a choking sensation, attended by vomiting and general convulsions, came on, which, however, did not attain an aggravated form; for, on withholding the compression, they disappeared in a few seconds." (*Op. cit.* p. 28.)

Compressing the carotids does not, of course, entirely cut off the supply of arterial blood to the brain; but these experiments render it probable that sudden occlusion of all the arteries of the head will as certainly excite epileptic convulsions in man as in the lower animals.

There is a class of cases in which a sudden arrest of the blood in its passage through the lungs causes convulsions and speedy death. I mean cases in which the circulation is arrested by the admission of atmospheric air into the veins—cases of embolism of the pulmonary artery; again, cases in which the flow of blood through the lungs is stopped by the injection of certain salts into the veins; and, lastly, cases of acute apnœa. When animals are killed by blowing air into the veins, the breathing becomes hurried, the animal falls down, and usually dies in convulsions; the contents of the bladder and rectum being being frequently expelled at the time of death. Dr. John Reid states that, "in a very few cases only, is death from this cause not preceded by convulsions." (*Physiological, Anatomical, and Pathological Researches.*) The immediate cause of death in these cases is the arrest of the frothy mixture of air and blood in its passage through the minute pulmonary arteries (the air rarely reaches the left side of the heart); and, as a result of this arrest, there is, of course, anæmia of the brain and of every other organ supplied by the systemic arteries.

In man, it appears that death from the admission of atmospheric air into the veins has been less frequently preceded by convulsions. Probably the chief reason of the less frequent occurrence of convulsions in the human subject is, that the amount of air accidentally admitted is less, and death, consequently, is less rapid than when air is forcibly driven into the veins of an animal. It would probably be found on a careful inquiry, that the occurrence of convulsions in these cases depends upon the circulation being suddenly and completely arrested.

Convulsions are mentioned in only five out of fifteen cases collected by Amussat; but, Dr. Reid remarks, "several of the cases, as we might have expected, are very imperfectly reported; for it is not to be supposed that the surgeon or his assistants should possess the coolness and time to watch narrowly the phenomena, when their minds were agitated by the threatened sudden dissolution of their patient, and their attention distracted by anxious attempts to save him." For the same reason, the record of cases of pulmo-

nary embolism is very imperfect; but, in some instances, it has been observed that death was preceded by violent convulsions; and Virchow noted, amongst the results of artificial embolism of the pulmonary artery in animals, convulsions and dilatation of the pupil. (*Des Emboles Pulmonaires.* Par B. Ball, p. 129.)

Again, Blake found that an injection of a solution of soda or its salts into the veins of a dog, destroys life by arresting the flow of blood through the lungs. The left side of the heart is found empty, and the right distended. Death occurs in about forty-five seconds, and is preceded by violent opisthotonos. (*Edinburgh Medical and Surgical Journal*, vol. liv., p. 343.)

Blake attributes the nervous symptoms to the venous pressure on the brain; but they may, with much more reason, be attributed to the arrest of the arterial supply to the brain. When, from any cause, the blood is arrested in its passage through the lungs, it is obvious that distension of the systemic veins must have, as its necessary correlative, comparative emptiness of the systemic arteries; the one will be an index and a measure of the other.

Lastly, we have the convulsions which occur in almost every case of acute apnœa or sudden suffocation. It is generally supposed that the convulsions of apnœa are excited by the circulation of black blood through the brain; but they are more probably due to the rapid and extreme anæmia of the brain consequent upon the impeded transit of blood through the lungs. When the air is excluded from the lungs, the circulation is rapidly arrested by the contraction of the minute pulmonary arteries. That this is the true explanation of the convulsions of apnœa, is rendered highly probable by an observation of Kussmaul and Tenner (*op. cit.* p. 75), to the effect that "the approach of convulsions in strangulation can be accelerated if the arteries are simultaneously compressed." It is obvious that, if the presence of black blood in the brain were the cause of the convulsions, their approach would be retarded, and not accelerated, by compression of the arteries which supply the brain. The facts are consistent only with the theory that the immediate cause of the convulsions in cases of suffocation is a rapidly increasing cerebral anæmia, resulting from the arrest of the pulmonary circulation. Black blood, in so far as it is deficient in oxygen, is equivalent to no blood. Probably it is rather by its negative quality of being unoxygenised, than by any positively noxious properties, that it is unsuited to maintain the functions of the brain. It is probable, too, that the minute cerebral arteries resist the passage of black blood, and so increase the anæmia of the brain. If the circulation of dark blood through the cerebral vessels would excite convulsions, we should expect to find this symptom of common occurrence in cases of emphysema with bronchitis.

I have now referred to instances of epileptiform convulsions occurring under a considerable variety of circumstances, but all agreeing in this one condition, namely, that the convulsions are associated with a defective supply of arterial blood to the brain. Let us now proceed to inquire whether the phenomena of epileptic convulsions, as they ordinarily occur in the human subject, are consistent with the theory of anæmia. It is a matter of general observation that, at the very commencement of an epileptic fit, the face is pallid. There is anæmia of the superficial vessels; and with this there is probably associated anæmia of the intracranial vessels which supply the brain itself. The pallor is in most cases soon succeeded by lividity, owing to venous engorgement consequent upon the impeded respiration and pulmonary circulation. It is very remarkable that, while the face is pallid, the heart and the carotids are beating strongly. It is probable, therefore, that there exists some impediment to the flow of blood through the minute branches of the arteries. To explain this impediment, Kussmaul and Tenner suggest that the minute arteries, both the superficial and the intracranial branches, contract so as to bar the passage of blood. Hence arise the pallor of the face and the epileptic convulsion. In some cases, it is said that the face is more or less livid at the very commencement of the fit. The probable explanation of this is, that the respiratory muscles are convulsed, and there is a consequent venous tur-

gescence before the spasm affects the facial arteries. The spasm of the *facial* arteries, though usually present, is obviously not the cause of the fit. The early implication of the respiratory muscles is clearly shown in those cases in which the "epileptic cry"—a result of spasm of the glottis—is the first indication of the fit.

Kussmaul and Tenner endeavoured to support the theory of arterial spasm by experiment, and to some extent they succeeded. In each of three white rabbits they ligatured the two subclavians and one carotid; the cervical sympathetic was then exposed and galvanised, with a view to excite contraction of the arteries by the stimulus conveyed through the vaso-motor nerves. In two animals, no effect was produced; but in the third rabbit the background of the eye became completely pale; the pupil dilated, so that the iris could scarcely be seen; the neck was drawn back; and violent convulsions occurred. The electrodes being removed, the spasm ceased, the pupil contracted, and the background of the eye became red; but the animal continued in a swooning condition. After some minutes, electricity applied to the sympathetic nerve produced the same effects as at first. A third attempt did not succeed.

The authors suggest that these experiments deserve repetition, with the view of rendering certain what at present is probable; namely, "epileptic convulsions can be brought about by contraction of the blood-vessels induced by the vaso-motor nerves."

According to this theory, then, epilepsy is a result of sudden anæmia of the brain; and this anæmia, when not caused by hemorrhage or by a mechanical impediment to the circulation outside the cranium, is due to an extreme contraction of the minute cerebral arteries. With reference to this theory of arterial contraction, all cases of epilepsy may be arranged in two distinct classes: 1, cases in which the arterial contraction is the result of a purely nervous or reflex influence; 2, cases in which the arterial spasm is a result of blood-poisoning.

In the first class are included all cases of epilepsy which are due to emotional influence, sudden terror, or anger, or long continued anxiety and sorrow, perpetuated and intensified often by nocturnal dreams and frequently recurring nightmare; also cases associated with those disordered states of the nervous system which are the result of vicious sensual habits; cases, too, in which the disease is hereditary. This class also includes cases of epileptic convulsions from the irritation of the gums during dentition; of the kidney, or the ureter, or the gall-duct, by a calculus; and of the alimentary canal by worms. Again, the cases in which convulsions result from tumours or other organic disease of the brain are included under the head of epilepsy from a reflex influence. The structural change in the brain is not the proximate cause of the epilepsy; it excites the epileptic convulsions through a secondary reflex influence upon the blood-vessels. Dr. Brown Séquard's guinea-pigs, rendered epileptic by injury to the spinal cord, are also included in this class of cases. The injury to the cord probably acts by increasing the reflex excitability of the nervous centres, so that a trifling external irritation suffices to excite a fit.

In the class of toxæmic epilepsy are included those cases in which noxious materials in the blood are the immediate exciting cause of the arterial spasm —uræmic convulsions, and all cases of convulsions from retained excreta; convulsions resulting from the admission into the circulating blood of unwholesome and undigested food; the convulsions which result from alcoholism; the convulsions which sometimes occur during the initiatory stage of certain of the acute febrile exanthemata, more especially small-pox; the convulsions which are occasionally associated with pyæmic infection; and the convulsions resulting from a poisonous dose of prussic acid. In each and all of these cases, it is probable that the immediate cause of the convulsion is anæmia of the brain, resulting from contraction of the cerebral arteries; the arterial spasm being excited by the presence of morbid blood in the vessels.

In the hypertrophy of the muscular walls of the arteries of the pia mater, which we have recently observed in cases of Bright's disease, we have evidence of a continual resistance to the passage of the deteriorated blood

through these vessels. This resistance probably explains some of the cerebral symptoms of Bright's disease; but a convulsive seizure must be due to a sudden temporary increase of arterial contraction—this sudden contraction differing as much from the continuous tonic contraction of the vessels, as the cardiac spasm of angina pectoris differs from the regular strong contractions of a hypertrophied ventricle. With reference to the action of prussic acid upon the blood-vessels, it is noteworthy that Blake, having killed a dog by injecting prussic acid into the jugular vein, observed that, after the animal had ceased to struggle, the dynamometer in the femoral artery still indicated a considerable increase of pressure. This fact is explicable only on the supposition that the prussic acid excited unusual contractions in the minute systemic arteries; and this contraction of the cerebral arteries would account for the convulsions in cases of prussic-acid poisoning. Again, the symptoms which result from an over-medicinal dose of prussic acid are such as might be occasioned by a less degree of obstruction to the cerebral circulation. These symptoms, as described by Pereira, are the following: "disordered and laborious respiration (sometimes quick, at others slow and deep), pain in the head, giddiness, obscured vision, and sleepiness. In some instances, faintness is experienced." These symptoms are remarkably like those of the epileptic vertigo, or *petit mal*, as it is called; and, like them, they are probably due to a temporary and partial interruption of the cerebral circulation by arterial spasm. The poison, being very volatile, is quickly exhaled by the lungs; and the symptoms soon cease. In accordance, then, with this theory of arterial contraction, epilepsy might be designated *cerebral collapse;* and, on the other hand, the arrest of the circulation by the contraction of the pulmonary arteries in the collapse of cholera may be looked upon as a form of *pulmonary epilepsy*. Without doubt, the true key to the pathology of both these awful diseases, epilepsy and cholera, is to be found in this doctrine of arterial spasm.

The two classes of epileptic cases—the purely nervous and the toxæmic——have their analogues in the two varieties of laryngeal spasm. Spasm of the larynx may result from irritation of the brain, or of the gums, or of the alimentary canal; in short, it may be a purely nervous reflex *laryngismus stridulus*, which is closely allied to epilepsy. On the other hand, laryngeal spasm may be excited by a crumb of bread or a grain of salt, or other irritant, within the larynx; and this is analogous to the arterial spasm which is excited by toxæmia, and which may result in an epileptic fit.

There are various forms of what may be called partial epilepsy: sudden and transient impairment of motor power, or irregular spasmodic movements limited to a particular set of muscles; various disordered sensations in limited portions of the skin; derangements of the special senses; sudden perversion of taste, or smell, or sight, or hearing; sudden impairment of speech; vertigo; confusion of thought; temporary delirium; and mental excitement. One or more of these symptoms may occur singly or variously combined in different cases, the onset and the departure being often equally sudden. In explanation of these phenomena, Dr. Hughlings Jackson has, with much ingenuity, suggested that they may result from a sudden temporary interruption of the blood-current through one or more branches of the cerebral arteries by spasm of their muscular walls; so that the brain-tissue within a circumscribed "arterial region," having its nutrjtive supply arrested or limited, would suffer a suspension or impairment of its proper functions. This appears to be a very probable explanation of the curious phenomena in question. It must be borne in mind, that the brain is not one organ, having a simple function, like a lung or a kidney; but that it is a congeries of complex organs, having very diverse functions. It seems probable that the physiological co-operation of all these cerebral organs may require that the blood-supply to the various regions of the brain should be specially regulated by certain branches of the arterial tree, under the guidance of the vaso-motor nerves; and this regulating power residing in the arteries probably renders them liable to disorderly action under the disturbing influences of disease.

It is not now my intention to enter into details as to the treatment of epilepsy; but there are two remedies upon which I desire to say a few words;

namely, chloroform and bromide of potassium. It is a well-known fact that chloroform inhalation has a remarkable power of arresting epileptic convulsions. Its action in warding off a threatened fit, and in cutting short a violent and prolonged paroxysm, is uniform and certain; as uniform and as certain as the influence of sudden and extreme anæmia in exciting convulsions. I for a time supposed that the chloroform acts by relaxing the cerebral arteries; Kussmaul and Tenner have shown that animals, when etherised, get no convulsions while being rapidly bled to death, or when their arteries are ligatured. It is probable, therefore, that anæsthetic vapours prevent or stop convulsions by lessening the reflex excitability of the nervous system, so that convulsions do not occur in etherised rabbits, even though the brain be rendered extremely anæmic by hemorrhage or by arterial obstruction.

Recent experience has amply proved that the bromide of potassium, in full and frequent doses and sufficiently long continued, is of great value in the treatment of epilepsy. The known physiological action of this medicine renders it probable that its curative effect in epilepsy is a result of its soothing, sedative, anæsthetic influence upon the nervous centres, whose reflex excitability it lessens. In short, its action in preventing convulsions is analogous to that of chloroform, differing in being less powerful and rapid in its operation, yet, by frequent repetition, its influence may be rendered more durable and more permanently beneficial.—*Brit. Medical Journal, March* 21, 1868, *p.* 265.

21.—ON ERGOT OF RYE IN THE TREATMENT OF NEURALGIA.

By Dr. Edward Woakes, Luton.

[Dr. Woakes published a paper last year on the correlation of neuralgia to skin-rash. It is possible that the consideration of some of the typical forms of this association of symptoms may throw some light on the more obscure forms of neuralgia.]

One inference arrived at was, that the rash, when present in neurotic disease, can be accounted for only by a reference to the structural anatomy of the parts involved in the lesion; while the uncertain fact of its occurrence was inferred to depend upon the nature and intensity of the exciting cause of the attack. In other words, the rash was looked upon as complementary of the pain, but having this important distinction, that, being a tangible symptom, whose causation could be traced, it suggested a clue whereby to unravel its more obscure and more formidable congener, the pain.

In order to make these remarks intelligible, I will, with your permission, briefly recapitulate so much of the theory as is necessary to show the connection between it and the treatment now proposed, which results as a direct corollary from it.

A comparison of the neuralgic and eruptive phenomena which occur when the nerve is wounded, with the corresponding symptoms exhibited in purely idiopathic cases of nerve-lesion, showed so close an approximation as to permit of their being regarded, for all practical purposes, as identical. The theory developed from this parallelism of symptoms was this:—The results being similar in both the traumatic and idiopathic classes, the causation in each group of cases, though differing in respect of intensity, operates through the same anatomical channels, and induces the same physiological phenomena in both.

In the traumatic instances, the symptoms were shown to be manifestly due to the paralysing influence of the injury or shock upon the fibres of the sympathetic system of nerves accompanying the *arteries* in their distribution to the *skin* and to the *sentient nerves;* and the resulting symptoms were found to be in accordance with the physiological sequence of such palsy.

In the other instances, that of idiopathic neuralgia associated with skin-rash, of which shingles may be taken as a type, the same theory of shock inducing palsy of the sympathetic fibres supplying the affected tissues was cited to explain the attendant phenomena. The sympathetic nerve-fibres accompany-

ing, say, an intercostal artery, are lost *in the direction of the skin*, on the minute divisions of the artery supplying its ultimate structure. When these nerve-fibres are paralysed from any cause, their function of regulating the calibre of the vessels will be withdrawn. Passive congestion of these vessels, and consequent effusion of liquor sanguinis, are the physiological consequences of this nerve palsy. Tracing such an effusion in a cuticular papilla, there will be found, in the first place a corresponding elevation of the cuticle covering it, which gradually gains the character of a true vesicle as the effusion increases, until in this manner a spot of herpes is produced. Following out the track of this anatomical clue, we are led to an explanation of the *pain* —the neuralgia—so often associated with shingles. The same artery which supplies the affected spot of skin, sends also nutrient vessels to the neighbouring sentient nerves, which vasi nervorum are furnished with regulating sympathetic fibres continuous with those proceeding to the cutaneous arterial twigs. These vasi nervorum will, therefore, acknowledge the same impressions, and manifest the same behaviour under them, as do the minute vessels of the skin when under the influence of shock, as just now described. Consequently, there will ensue, synchronously with the corresponding skin-phenomena, a state of dilatation of these vessels, and exudation from them of watery elements between the fibrillæ of the nerve; and, being confined in this locality by the fibrous sheath of the nerve, a mechanical stretching and compression of its constituent sensory fibres ensue, resulting, as might be expected, in the acute pain so characteristic of neuralgia.

It will be impossible here to repeat the entire argument on which these conclusions are based, and I must content myself by referring any one interested in the matter to the paper from which I have quoted. That shock of the kind alluded to is the proximate cause of shingles, is borne out by many examples, but by none more strikingly than one which recently came to my knowledge. A single young woman, aged about twenty, wore through one day, and at the cost of much suffering, a pair of stays considerably too small for her. In the course of three or four days, an attack of shingles supervened. Of course, it is not implied that the shock does in all cases assume the palpable form just mentioned; draughts of cold air, and other more subtle influences, being frequently the starting-point in the disease. The application of this theory is, *mutatis mutandis*, co-extensive with the wide range of neuralgic affections; and its soundness may be tested by its capability, in the first place, of suggesting an explanation of successful though purely empirical modes of treatment, and, in the second place, of originating new and more precise methods of cure.

In treating the pain remaining after a simple case of shingles, therefore—and the remark applies to all uncomplicated forms of neuralgia—the chief indication is to restore the tone of the vessels, withdrawn through the paralysing influence of the shock on the nerves controlling them. In other words, we have to induce in the sympathetic fibres concerned a return to their normal function of regulating the circulation through the small arteries and capillaries. This equilibrium being once restored, we may confidently expect the disappearance of the effused fluid from its disturbing situation amongst the fibrillæ of the sentient nerves.

The drugs hitherto found useful in the simple forms of neuralgia, the pathology of which I have so inadequately attempted to indicate, may, I believe, have their *modus operandi* traced to their influence upon the sympathetic nerves, through the medium of which they restore the suspended tone of the remote arterial circulation. To the list of these, foremost amongst which is belladonna, I would now suggest that there should be added the *ergot of rye* —basing the recommendation upon the experience of the following cases.

My attention was first drawn to this drug, as of probable use in nervo-therapeutics, from observing its power of controlling the hemorrhage in a case of hæmoptysis—showing that the range of its operations on the vascular system is by no means limited to that part of it represented by the uterine vessels. It seemed equally clear that its effect in this respect was mediated by the ganglionic nerves; and, therefore, that it was exactly adapted for exerting a

remedial effect over the pathological condition of neuralgia depicted in my theory. Examples might have been added where great benefit accrued from a combination of the ergot with other remedies adapted to the case; but those only are reported where the drug was administered *per se*.

Case 1.—*Shingles.*—M. M., a single female, aged 22, of sallow complexion. The catamenia had been absent six months. She had had headache six weeks; and sharp pain in the right side of the chest one week, after which an herpetic rash appeared beneath the right breast, extending backwards on this side to the spine. At this time (February 10th, 1868), there was also a sharp neuralgic pain (besides that below the breast) in the second right intercostal space. The bowels were confined. I ordered her an ounce of mistura alba three times a day. On February 12th, she was no better. The rash was extending on the same side. The pain was very severe under the right breast. Her person exhaled a peculiar pungent odour. On February 15th, she was in about the same condition, and was ordered to take fifteen minims of liquid extract of ergot in an ounce of water every four hours. On February 17th, she stated that the pain was very much better since taking the medicine. She passed a great deal of urine. On February 19th, the pain in the side was worse. The ergot was increased to forty minims. On February 21st, she had been almost free from pain since the last date. She said her sight was very dim. The pupils were dilated. She was ordered to discontinue the ergot, and take twenty minims of solution of sesquichloride of iron in water three times a day. On February 24th, the catamenia returned. The odour was gone. She felt quite well, and had no pain. On February 29th, she experienced a slight relapse of pain, with great weakness. She was ordered to discontinue the steel, and to return to the ergot, a very few twenty-minim doses of which completely cured her.

Remarks.—This instructive case points throughout to some lesion of the nervous system as the root of the malady. The pungent sweats are specially interesting, as they occur in some cases of wounded nerves, as pointed out in the report of cases of this kind from America. I believe the steel was prejudicial; and infer that, in many cases of simple suspended menstruation (chlorosis) in young females, ergot of rye is a preferable remedy.

Case 2.—*Sciatica.*—E. L., aged twenty-one, had pain in the left hip, shooting down the back of the leg in the course of the sciatic nerve, worse at night, with thick, high-coloured urine, during four months. The catamenia were regular. This, being regarded as a case of rheumatic sciatica, was treated for a week with alkalies and iodide of potassium; but, as the pain became worse, she was given, on March 3rd, 1868, ten minims of extract of ergot in an ounce of water every four hours. On the 4th, she stated that she slept much better; and the pain was much relieved since the previous day. On the 7th, she had had no return of pain since the 4th. She said she had not been so well for four months. Her remaining debility was met by a combination of ten minims of liquor ferri sesquichloridi and six minims of liquid extract of ergot, in water.

Remarks.—It will observed that this patient was cured completely in four days of an illness which had caused her increasing annoyance during four months. The case illustrates also a point supported by subsequent experience; viz., that, when ergot is likely to be useful, its good effects commence immediately.

Case 3.—*Tic Douloureux.*—Emma B., aged twenty-one, was attacked on April 27th, 1868, with very severe tic of the left side of the face, affecting especially the inferior dental nerve, and extending downwards to the shoulder. She had some dyspepsia, but otherwise was healthy. She was ordered to take an ounce of the following every four hours.

℞. Potassæ bicarbon. ʒ iss; infusi ergotæ ℥ vi; extract. ergot. liquid. ʒi. M.

On April 29th, the tic was almost gone. She complained now only of weakness. At her next visit, recovery was complete.

Case 4.—*Hemicrania.*—John Gray, aged about thirty-five, has been repeatedly under treatment for that form of neuralgia known as brow-ague. His attacks

have been cured alike by quinine and sesquioxide of iron. Sometimes they are very severe, and the treatment long continued. He was last seen in May 1868, when he had a very sharp attack of neuralgia of the right temple. He was ordered to take, every four hours, an ounce of a mixture of two drachms of liquid extract of ergot in six ounces of infusion of ergot. After taking this for two or three days, he was cured more satisfactorily and quickly than in his former attacks.

Case 5.—*Tic Douloureux.*—Miss E., aged twenty-two, was seen on June 2nd, 1868. She had had tic in her left temple for two weeks, very severe at times. The tongue was foul, the secretions normal, and the general health good. A stomachic with soda and rhubarb was prescribed. On June 4th, the tongue was cleaner; but the neuralgia was unrelieved. She was ordered to take, every four hours, an ounce of a mixture containing two drachms and a half of liquid extract of ergot in eight ounces of infusion of ergot. The neuralgia was relieved immediately after commencing this treatment, and entirely left her after using it two or three days.

In one case of chronic, and one of acute sciatica, the ergot failed to relieve; but it is hoped that the very favourable result which the examples now reported indicate to have accrued from its use may gain for the drug a more extended trial in neurotic affections; and that, shortly, sufficient data may be collected to enable one to decide with some degree of precision the class of cases in which to expect from it the marked benefit it is evidently capable of effecting in many forms of the disease.—*British Medical Journal, Oct.* 3, 1868, *p.* 360.

22.—ON THE ACTION OF ACONITE AND QUININE IN NEURALGIA.

By Dr. H. M. Jones, Physician Cork City Dispensary, Demonstrator of Anatomy at the Queen's College, Cork.

[In cases where the writer has used aconite he has always combined it with quinine. The cases most suitable for this treatment are facial neuralgia and cephalalgia.]

Having often seen the good results from the combination of these two powerful drugs, I determined to use them as a first means on this particular instance, and then thought that it might be a good example to add to the list of those brought before the profession of the use of aconite.

Mrs. H., aged 72, apparently very strong and robust, I saw on January 16, 1867, about six p. m., suffering the most excruciating torture, quite unable to speak coherently and shrieking dreadfully from pain. Her daughter explained to me that this had come on violently since three p. m. of the same day, but that for a few days previously, she had suffered slight neuralgic attacks in the arm and side. The old lady writhing in agony directed my attention to her thumb, and from her daughter I learned the following history:—Twenty-five years previously she had injured her hand; the bones of the thumb got affected, and Sir P. Crampton wished to take away a piece of one. This she would not consent to, and five years subsequently, during a period of extreme cold and frost, she got a bad attack of neuralgia, and went to her physician, requesting him to amputate the thumb, so bad was the pain in it.

Though shaken greatly in her general health, she had no return of neuralgia for a period of twenty years, until the severe frost of January of this year again brought it on. I was on the point of examining the thumb, but the moment I touched it, she screamed most violently, and got into such a state, that it completely prevented any further examination, and I refrained, satisfied that she suffered from pure nervine pain propagated by the old lesion in the thumb, and fostered by the extreme cold—she having gone out each day to chapel notwithstanding her daughter's entreaties. My visit was hurried, as I saw that her suffering was so intense, and all she could now say was that if I knew of no other means to alleviate the pain, to get the thumb amputated forthwith.

I ordered immediately—Tinct. aconiti, ʒi.; quinine bisulph. ʒss.; acid sulph. dil. ʒi.; aq. ad. ℥viii. M. ℥ss. stat. et rept. omni sec. hora, directing that if anything unusual occurred to send for me at once, but that I'd see her early the next morning. I did so, and to my astonishment, for I thought the amount of relief I might have afforded the old lady never would have satisfied her, she expressed herself very thankful to me, and I saw at a glance that she was much better. Questioning her regarding any sensation she might feel, she complained of numbness and tingling in her fingers and toes; she had had a few hours sleep in the night after four or five doses of the mixture, and it was after the sleep she awoke so much relieved. She apologised for being, as she said, so like a mad woman on the previous evening. I now ordered the mixture to be given only every third hour, and seeing her the same evening so much better, I discontinued the use of the aconite, and reduced the dose of the quinine. She then recovered completely, and I have not since seen her. I tried the strength of the tincture I used in this instance, as follows:—I selected a fine buck-rabbit, and having kept it some hours previously without food, gave it ten drops of the tinct.

1st. Ten drops—no effect.

2nd. Ten drops, one hour after: spasms about the throat and twitchings about its mouth set in.

3rd. Ten drops, one hour after last: more spasms, limited to the mouth and throat.

4th. Ten drops, one hour after last: more spasms, limited to the mouth and throat.

5th. Twenty drops, half-an-hour after: great difficulty of breathing, and spasms of jaws.

6th. Half-an-hour after, twenty drops: same result, increased in energy.

7th. Twenty drops, half-an-hour after: violent convulsions of all the body, jerkings of head and hind limbs, the latter thrown alternately out, and gaspings; death in about half a minute after the dose, so that *less* than ʒ ii of this tincture produced death, divided over a period of more than four hours. We may notice, in this case I have quoted, a few points:—1st. The effects of severe cold in developing a disorder latent for so many years, as also that the thumb had recovered the effects of the injury; *it* was the part to originate the general disorder of the nerves of the arm, shoulder, and face. 2nd. The rapid subsidence of such severe pain under the combined influence of aconite and quinine.

Now, before answering the question as far as pathology and physiology will allow us: How do aconite and quinine combined, or aconite alone, affect a neuralgic patient? we must first decide what is neuralgia? and here is the first difficulty. Without entering into varied discussions we may take as the results of the researches of those interested in this curious affection, that it is due to some morbid change in the nerves of parts, often not *recognisable* after death, as slight thickening, vascularity, or pressure from tumours in their immediate neighbourhood, these changes being the active causes which are set in motion by external or internal agencies, as atmosphere in the first case, or stomach and intestinal disorders in the second, both alike giving rise to intense suffering traceable often to no cause, but this external or internal agency which produces, in some unknown manner, a state of increased sensibility of the nerves of sensation of certain regions not even evidenced by any visible changes in these parts, or again to some low state of vitality of certain peripheral nerves, consequent on a disordered condition of surrounding structures, or the direct result of any *injury*.

Looking, now, practically as to the manner in which aconite given internally can be a remedy for any of those morbid states:—1st. As a contra-stimulant either by a direct action conveyed to parts by the blood, as evidenced by the numbness and diminished sensibility, this influence being felt by parts preternaturally excited before acting on the system generally (Fleming). 2nd. By a direct sedative action on the circulation as shown by its action on the heart's pulse. 3rd. By diminished power of sensibility of the brain—it being, as Bouchardat states, a stupifying agent, less powerful than belladonna or

opium. We may thus make a two-fold division of its mode of action on a neuralgic part.

1st. Reducing any increased vascularity and excitability.

2nd. Exercising a healing influence on the nerves of the part, and deadening sensibility in the nerves of the affected region, both effects being increased in proportion as it influences the nervous system generally through the brain; and as Dr. Fleming remarks, "if an organic lesion, resulting from an injury, be not present, our cure may be permanent," if it is only temporary. The physician, always remembering the physiological action of aconite, must seek for those states of the system which contraindicate its use, and not stigmatise a drug as noxious and dangerous, which, if given in congested states of organs, lungs, or otherwise, will decidedly verify his worst anticipations; or if in anæmic states of the system we give this powerful drug, we must only blame our own rashness, if its indiscriminate use leads us into trouble.

To enter into the vexed question of the exact way in which quinine acts, whether it is a tonic, acting simply by catalysis (Headland) on the blood, or by giving it some essential ingredient in which it is deficient. For my part, I must confess myself an advocate of the logical conclusions drawn by Dr. Headland on this matter in his recent able edition on the "Action of Medicines," believing quinine to be a restorative medicine, not directly neurotic, and adducing in evidence the discovery of Dupré and Jones by means of the fluorescent test, which establishes the presence of a substance in the blood similarly constituted to quinine. Certain it is that quinine is not excreted in any quantity, and it requires very large doses to detect its presence in the urine. To satisfy myself of this fact, I obtained some pure *quinia* from the Apothecaries' Hall, Dublin, and gave, at intervals, to a healthy man (a pensioner) 33 grains in the 24 hours. He suffered from pains in the loins, head and back. I got him to pass urine immediately before the first dose, and then obtained all he passed in the 24 hours, amounting to 54 fluid ounces. It was quite clear and *healthy*. I first took two ounces and rendered it slightly acid with tartaric acid, evaporated to dryness, dissolved in absolute alcohol, and evaporated in a water bath, filtered, and extracted the residue, and repeated this process three times. I then extracted the residue with more alcohol, to which remainder, by this time very minute and colourless, I added solution of carbonate of potash, and got a *white precipitate*, perfectly soluble in ether, but failed to get the chlorine and ammonia test on the evaporation of the ether. On again repeating the same process with four ounces of this urine, I got the green with chlorine and ammonia, but from the quantity I obtained altogether from the six ounces, I should say that not more than a few grains passed entirely through the urine. We may thus look on quinine as producing a *permanent* change in the blood, either filling up some deficiency, or producing some change in its integral constituents, and so altering the existing state; and conclude that quinine acts through the blood, and that its effects in nervine disorders are due to this blood action, which is restorative in character. So that it is indicated in any deranged state of the system which clinical experience shows to be the result of certain morbid states of the blood, originating in a deficiency or change in its ingredients, as evidenced by a certain class of affections that follow those particular changes.

Is not, then, neuralgia often the result of such changed conditions of the blood? Pathology, in many instances, can assign no cause for it! Morbid anatomy looks in vain for any state to account for the life symptoms, and though we may have palpable causes during life, and apparent after death, still, in many instances, we can assign no reason for suffering but some debilitated state of the blood, anæmic or otherwise, no practical physician having failed to observe the relation that exists between neuralgia, debility, and hysteria; often do we find all three co-existing in the same individual, and as surely as chlorosis and hysteria are allied, so are neuralgia and other debilitated states. The question arises, then, does not quinine, by altering this morbid state, relieve the condition that it has induced? and this I believe to be its true action. And so we may use it as a valuable adjunct to aconite—1st. In neuralgia occurring in anæmic or debilitated patients, without any

apparent nerve-lesion or exciting cause. 2nd. In old cases of neuralgia, where the primary disease has induced a state of the circulation at the part affected not in accordance with health. 3rd. In all cases where, to a temporary relief, we would add permanency of cure.—*Medical Press and Circular*, *July* 1, 1868, *p.* 5.

23.—A CURE FOR HEADACHE.

By Dr. George Kennion, Harrogate.

I am desirous of bringing before the notice of the profession a very simple, and at the same time a very remarkable, cure for many kinds of headache. I have not the least claim to the discovery of this remedy, nor, indeed, am I at all aware who was its originator; but I believe that it is unknown to the profession generally; and, having used it for nearly twelve months in a very large number of cases, and very rarely without affording immediate relief, I am desirous of making it more generally known. I heard of it first from a gentleman whom I was attending last year, and who told me that he thought it was used by a French physician. If this should come under his notice, I hope that it may be the means of inducing him to drop his incognito, so that he may receive the thanks of many to whom he has hitherto been an unknown benefactor.

The remedy, as I have already observed, is simple; it is the bisulphide of carbon in solution. Its mode of application is no less simple. A small quantity of the solution (about two drachms) is poured on cotton-wool, with which a small, wide-mouthed, glass-stoppered bottle is half filled. This of course absorbs the fluid; and, when the remedy has to be used, the mouth of the bottle is to be applied closely (so that none of the volatile vapour may escape) to the temple, or behind the ear, or as near as possible to the seat of pain; and so held for from three to five or six minutes. After it has been applied for a minute or two, a sensation is felt as if several leeches were biting the part; and, after the lapse of two, three, or four minutes more, the smarting and pain become rather severe, but subside almost immediately after the removal of the bottle. It is very seldom that any redness of the skin is produced. The effect of this application, as I have said, is generally immediate. It may be re-applied, if necessary, three or four times in the day.

The class of headaches in which this remedy is chiefly useful is that which may be grouped under the wide term of "nervous." Thus neuralgic headache, periodic headache, hysterical headache, and even many kinds of dyspeptic headache, are almost invariably relieved by it; and, although the relief of a symptom is a very different affair, of course, from the removal of its cause, yet no one who has witnessed (and who of us has not seen?) the agony and distress occasioned by severe and repeated headache, but must rejoice in having the power of affording relief in so prompt and simple a manner.

As regards the *modus operandi* of this remedy, it is difficult, perhaps, to form a certain opinion; but I am disposed to attribute it to the sedative effect of the vapour of the bisulphide, absorbed through the skin, and acting upon the superficial nerves of the part to which it is applied. The remarks of M. Delpech (*Annales d'Hygiène*, Jan. 1863) point out very clearly the remarkable prostration of the whole nervous system produced in workmen who, in certain manufactures, are exposed to the vapour arising from a solution of the bisulphide of carbon; and we can readily understand that a somewhat similar effect, upon a small scale, may be produced by the application of this vapour to a limited portion of the surface.

I always procure the bisulphide of carbon from Mr. Morson, the eminent chemist in Southampton Row, Bloomsbury, who will also furnish the bottle with which the vapour should be applied, and a wooden case—a very necessary adjunct, on account of the offensive smell of the bisulphide.

[A correspondent (G. F. E.) of the British Medical Journal, in noticing the above, recommends the use of chloroform in place of the bisulphide of carbon. He says:]

Dr. Kennion, of Harrogate, calls attention to the efficacy of the vapour of bisulphide of carbon in relieving certain forms of headache. I have for a long time been in the habit of applying chloroform in the same manner as he uses the bisulphide of carbon, and with the same happy results. Among other cases I have found it give relief and procure sleep in one of agonising hemicrania, which came on a few hours after childbirth. Without any wish to lessen the merit of Dr. Kennion's suggestion, I have ventured to recommend a different agent for the following reasons:—Chloroform is much more likely to be at hand than the bisulphide; it is devoid of the offensive odour of the latter; and, if I am not mistaken, it will be found quite as effectual. I may add that, in those cases of hemicrania which depend on gastric derangement, eight or ten minims of chloroform, given internally, will materially assist the effect of the local application.—*British Medical Journal*, *June* 13 and 20, 1868, *pp.* 584, 626.

DISEASES OF THE ORGANS OF CIRCULATION.

24.—ON THE THERAPEUTICAL ACTION OF DIGITALIS IN DILATED CONDITIONS OF THE BLOOD-VESSELS.

By Dr. Archibald Reith, Physician to the Royal Infirmary of Aberdeen.

[There is ample evidence that digitalis has acted as an apparent sedative to an over-excited heart.]

There is equally good evidence that digitalis has acted as a tonic to the weak and enfeebled heart. As this doctrine is not yet so generally received as the last, I may enter more particularly into its proofs. Withering, in 1785, in his memoir on digitalis, relates cases of dropsy which were cured by free use of the medicine. The description of these cases shows that they belonged to the class which modern physical diagnosis would refer to enfeebled heart. Sir Henry Holland, in his "Medical Notes and Reflections," considers digitalis as more appropriate for an enlarged flaccid heart than for hypertrophy. The late Mr. Jones, of Jersey, speaking of the treatment of delirium tremens by large doses of digitalis, says, "The pulse, so far from being lowered in force, becomes fuller, and stronger, and more regular, soon after the first dose. . . Doses of half a drachm or a drachm do no good whatever; and the pulse, in some cases where I tried them, became intermitting. I have never seen this effect from the larger doses; on the contrary, a feeble intermitting pulse has generally soon become fuller and more regular." On the same subject Dr. Ballard remarks,—"It certainly is not what any one would have expected, that a feebly acting heart would be roused into normal action by a medicine like digitalis; yet this is one of its earliest effects in the doses given by Mr. Jones." Dr. Peacock in like manner says,—"In no instance were any alarming symptoms of depression induced; but the pulse usually soon fell remarkably in frequency, and acquired greater power and steadiness." "The drug, when exhibited in full doses (in delirium tremens), does not by any means produce the amount of depression which our previous experience of its action, in small and frequently repeated doses, would have led us to expect." We are, however, mainly indebted to Dr. Handfield Jones for the elaboration of this important subject. So far back as 1859, he regarded digitalis as a cardiac tonic. He relates two cases, on which he remarks in the following terms:—"No better case could be imagined to test the influence of digitalis, and the result was certainly unequivocal. Instead of causing any further depression of the enfeebled organ, it decidedly increased its tone and power, and enabled it to carry on its function better than when any other remedy was given. If digitalis were in any degree a cardiac depressant, it would have extinguished the weak contractility of the poor fellow's heart, instead of arousing it. . . On the whole, the two cases related afford some evidence that digitalis is a *cardiac tonic*, and certainly prove that it may be given with advantage in cases of great cardiac debility.

Various writers have confirmed Dr. Jones's statements. Numerous cases are recorded in the medical journals of a similar nature to those commented on by him. An examination of the subject is made by Dr. Murray, of Newcastle, who comes to the conclusion that there is not a single disease or condition of the heart, *attended by weakness*, in which it may not be given with safety and benefit. When rapidity of pulse depends on cardiac weakness, digitalis will reduce it. The weaker the muscular tissue of the heart, the safer will be the administration of the medicine. On the continent also the same opinions are entertained. Winogradoff shows that digitalis exerts no change in the strength of the pressure of the blood in the arteries, and that, therefore, it may be given without risk in morbid conditions attended with diminished pressure, as in morbus cordis, with insufficient compensation. Germain and others regard digitalis as a cardiac tonic. Lastly, I may give the opinion of Dr. Fuller, whose remarks contain the summary of this view of digitalis. He says, "Experience and observation may be alike appealed to in proof that digitalis stimulates the muscular fibre of the heart, and augments the contractility of the capillaries. When it kills, it does so not by producing paralysis of the heart, but by giving rise to tonic contraction and spasm of that organ. Such being the case, it is a most valuable remedy in the treatment of dilatation, and is dangerous only when administered in hypertrophy. When the pulse is feeble and irregular, and more especially when from any cause its feebleness and irritability are temporarily increased, digitalis is, of all known remedies, the most useful." Dr. Fuller's conclusions on this subject are best given in his own words:—1st, During many years I have observed that the cases of heart disease most benefited by digitalis have been those in which the heart has been weak and dilated, and the pulse feeble and irregular. In these the pulse has become stronger and steadier, and less frequent under its action. 2ndly, In the only cases in which I have known death to occur suddenly during the administration of digitalis, the heart has been hypertrophied and firmly contracted. . . . 3rdly, Dr. Dickenson has pointed out (Med. Chir. Trans., vol. xxxix), and I have repeatedly verified his observation, that digitalis, if given in full doses, induces violent uterine contraction, and checks uterine hemorrhage; and, inasmuch as its action in staying menorrhagia and uterine hemorrhage is permanent, it seems fair to conclude that it gives tone to the capillaries, and increases their contractility. . . . 5thly, When patients die of delirium tremens, the pulse is usually rapid and fluttering before death, and the heart is found weak, flaccid, and distended with blood afterwards. These are just the cases in which, on the commonly received doctrine as to the action of digitalis, the drug ought necessarily to prove fatal, and yet modern experience has shown that in these cases it is tolerated even in excessive doses. . . . 6thly, It has been proved by experiments on animals (Dr. H. Jones) that, when death is induced by digitalis, the heart is not flaccid and distended with blood, as is commonly supposed, but on the contrary, empty, contracted to the utmost, and in a state of tonic spasm. All these facts confirm my view as to the action of digitalis, and if it is to correct its practical importance in relation to the treatment of cardiac dilatation, can hardly be over-estimated."

My own experience of digitalis as a cardiac tonic is fully in accordance with these views. I shall have a few remarks to offer presently on its use in enfeebled heart.

[There are two opinions entertained regarding the theurapeutic action of digitalis. By some it is considered a direct cardiac sedative and depressant; by others a cardiac tonic and stimulant. There is but one way of escaping this difficulty, and that is, by allowing to digitalis a double action on the vaso-motor system, such as recent researches render probable is possessed by medicines in general.]

Is it possible, in the present state of our knowledge, to construct a theory from the accumulation of facts possessed which will tend to reconcile existing differences? I think it is; and will now proceed to do so.

The views which I am about to offer have at least the merit of simplicity.

Whether they be accepted as true or not, it will be admitted that they have the support of physiological and pathological observations. Without denying or throwing discredit on a single fact hitherto noted, I am sanguine enough to believe that they will in great measure, remove existing difficulties and diversities of opinion. The evidence is certainly not so complete as could be desired, but as far as present data can guide us, it is sufficient, I think, to warrant a fair conclusion. Further information will probably corroborate the statements I am now to make.

It is of the highest importance, first of all, to have a true conception of the physiological action of digitalis on the healthy body. From the numerous observations which have been made on this point, it would appear that the symptoms manifested by the drug are pretty uniform. Digitalis is, then, what is called an irritant, or taking the totality of its symptoms, a narcotico-irritant poison. The powder, when applied to the mucous membranes or to the denuded skin, produces smart irritation. The local inflammation thus created, in accordance with pathological laws, consists of two primary stages. In my first paper (Edinburgh Medical Journal, February, 1868), I endeavoured to show that irritation, or a dilated condition of the blood-vessels, depended in great measure on paralysis of the sympathetic system; and that this paralysis necessarily implied a previous condition of excitement or spasm of the blood-vessels. These two actions invariably occur when a stimulus is applied to any tissue or organ. The consequent spasm of the blood-vessels is followed by a corresponding reaction to the opposite condition, or dilatation. The local effects of medicinal agents are similar, and hence drugs may be used in a twofold manner, the primary action of spasm being obtained by a very small dose, and the secondary by a larger one. Digitalis has, therefore, like other medicines, a double property; it first excites the vaso-motor system, contracting the blood-vessels, this operation being followed by more or less reaction to paralysis or dilated blood-vessels.

Various therapeutical observations tend to confirm the primary spasmodic action of digitalis. Handfield Jones says: "Kulp's account of the action of digitalis in inflammatory disease seems to prove that it induces arterial contraction, rendering the hands and face cold. Its action upon the uterus in menorrhagia, and on the arteries in hemorrhages, seems also to be of this kind." Dickenson points out the use of digitalis in menorrhagia, and this has been attributed with propriety to its contractile power on the blood-vessels. Trousseau makes the same observation, though he finds it unnecessary to give large doses for the purpose. Legroux believes that the primary action of digitalis is to narrow the capillaries, but he falls into the mistake of attributing the reduction of the heart's pulsations to this. There is thus, I think, ample evidence obtained from experience and from analogy that digitalis is possessed of the twofold property above mentioned.

Let us now examine its effects upon the heart, in the light of this double action. It seems to be proved beyond doubt that digitalis stimulates the heart to increased power when given in full doses. Physiologically it causes spasm of the muscular tissue, evinced by tumultuous, irregular action, and by the ventricles being found contracted and rigid after death. There is induced, as it were, an artificial hypertrophy, differing only from the morbid condition in the absence of increased development and of valvular disease; unless, indeed, Germain's account be true that digitalis constricts the aortic valves, in which case the resemblance would be well nigh complete. It is hypertrophy, in all but the lapse of time, the muscular tissue not having grown. The rationale of this is that digitalis paralyses the vaso-motor nerves of the heart, whereby greater determination of blood takes place to the ventricular walls; spasmodic contraction ensues, which has the effect of not only emptying the cavity, but also of emptying the vessels of the muscular tissue at the moment of greatest spasm. As relaxation takes place, the blood-vessels become filled, and the cavities distended with blood; but before the ventricle has time to expand sufficiently, it is forced to contract spasmodically again, and thus the action goes on more or less irregularly until complete ces-

sation of the heart's movements. The last closure of the ventricle remains after death, and the paleness which has been observed would be accounted for by the absence of blood in the tissue. Sometimes, as in Bernard's examples, slight relaxation occurs after the final spasm, owing to blood coming from the lungs entering the left cavities, but this is succeeded almost immediately by permanent rigor mortis. The apparent weakness and irregularity of the pulse may be thus satisfactorily explained; and the so-called sedative action of digitalis in fevers and inflammations is shown to depend not on the reduction of the pulse, but on the increased force of the ventricular contractions. The success which is said to attend the practice of freely exhibiting digitalis in such cases is not very equivocal,

It is, then, paralysis of the vaso-motor nerves, and determination of blood to the heart, which characterise the physiological action of digitalis. This implies, however, that there must have been a previous action of excitement of the sympathetic, or spasm of the cardiac blood-vessels. The physiological action is in reality the secondary, and cannot take place without a prior stimulant effect on the nerves. It is not very easy to demonstrate this, on account of the rapidity with which the primary effect disappears, but it may be done from the following considerations:—

1. A dilated condition of the blood-vessels, or paralysis of the sympathetic, must have been preceded by spasm (excitement of sympathetic), of however short duration.

2. With the majority of medicines this state of spasm is usually more or less imperceptible, partly on account of its comparatively short duration, and partly because it may be too limited to produce appreciable symptoms. It may be impossible to demonstrate its existence by any symptom except by the curative effect of a medicine given so as to produce only a spasmodic effect on the vessels.

Applying these considerations to digitalis, we conclude that its physiological action is preceded by stimulus of the sympathetic or spasm of the cardiac blood-vessels. Fortunately we are able to take cognizance of this primary action; for not only is it manifested in various parts of the body, as evidenced by the therapeutical observations formerly mentioned, but it is also witnessed on the heart itself in cases of poisoning. Various writers have stated, that, in their experiments, the heart's action is momentarily quickened before it begins to act spasmodically. The same phenomenon occurs sometimes during the administration of aconite. a notably increased frequency of pulsation having been occasionally observed prior to the true depressing action of the drug. In neither case is it the quickening of increased circulation, but that of diminished supply of blood, rendering the heart's action similar to what it is towards the close of a fatal illness. When we put all these facts together, therefore, there is fair reason for regarding the symptoms produced by digitalis on the heart as of the twofold character already described; what is known as its physiological action depending on increased determination of blood to the muscular tissue,—this, in its turn, being a reaction from a previous condition of spasm.

Although aconite and digitalis have the same action on the cardiac blood-vessels, there is, nevertheless, a marked contrast between them. The former seems to influence the whole nervous apparatus, while the latter acts on the vaso-motor nerves alone. From the investigations and experiments of Winogradoff and Dybkowski and Pelikan on digitalis, and of Liégeois and Hottot on aconite, the following results are obtained:—The action of digitalis is not identical with stimulation of the pneumogastric, for, when that nerve is galvanized, there is not only diminished frequency of the pulse, but a sinking of the mean pressure of blood in the arteries, a condition not produced by digitalis. Under the influence of digitalis, Dybkowski and Pelikan found that the action was not delayed or altered by destruction of the medulla oblongata, or by section of the pneumogastrics. Galvanization of the pneumogastrics also produced its usual effect of slowing the heart's action, even when the system was under the influence of the poison; while, as a rule, galvanization of the vaso-motor nerve, when the heart was stopped, did not

re-excite its action. From these experiments it seems that the determination of blood to the heart, which aconite produces, is attended by an influence on the pneumogastrics and whole nervous apparatus, while digitalis acts only on the vaso-motor nerves. Moreover it would appear also that the action of digitalis is limited to the ventricular portion of the heart. The post-mortem appearances reveal the fact, noticed by many, that the left ventricle almost always remains strongly contracted, quite empty and pale, while the auricles are distended and full of blood. The power of aconite is, therefore, much greater than digitalis; first stimulating the cardiac sympathetics, it causes slight quickening of the heart's movements, subsiding immediately through the influence on the pneumogastric nerves to great slowness and feebleness; and this is followed by more or less reaction, to increased force and frequency of the pulsations. Digitalis, on the other hand, by simple excitement of the ventricular vaso-motors (contracted vessels), temporarily quickens the heart's action, and then, through paralysis of those nerves (dilated vessels), spasm of the muscular tissue follows, as before detailed.

The foregoing views of the physiological action of aconite and digitalis will throw considerable light on their application to therapeutics, and confirm in a striking manner, previous empirical observations on the subject. In the majority of cardiac affections, one or other of these two medicines will be found more or less remedial. Deprived of them, we should lose the very best means we possess of relieving suffering. The difficulty consists in selecting the proper remedy for the particular case. The general guiding principle in their selection may be thus expressed:—

The corresponding symptom of aconite is paralysed general nervous action, or fever.

The corresponding symptom of digitalis is paralysed limited nervous action or hypertrophy.

Aconite, therefore, is the prime remedy for the febrile state, when given in very small doses, as stated in my last paper; digitalis is the remedy, in very small doses, for hypertrophy. Now, here is the point where the old and the new opinions come into collision—one party declaring that it relieves hypertrophy, the other stoutly maintaining that it aggravates it. What is the real truth of the matter? Just this, that in doses large enough to induce reaction, digitalis will prove hurtful, if not dangerous, in hypertrophy; but in much less quantity, or stimulating doses, it will prove beneficial. The statements of the best observers are in favour of this view. It has been found that the beneficial effects of digitalis in hypertrophy were best marked in small doses. Trousseau and Pidoux say:—"These experiments are, moreover, confirmatory of a fact long since acknowledged, namely, that to exercise its sedative action on the circulation, digitalis must be administered in small doses. Hypertrophy, then, requires only the primary action of digitalis for its relief, and will be aggravated by any approach to the secondary. But we can suppose a condition of the heart existing where a hypertrophic state would be required to effect a cure, and any drug that would physiologically create hypertrophy would be the proper remedy in the case. Such a condition is found in dilatation and enfeebled heart, and such a drug is digitalis when administered in physiological or tonic doses. The experience of every one must confirm this view.

Let us suppose an analogous case elsewhere. We wish to cure diarrhœa or a dilated condition of the intestinal blood-vessels. The best remedy for the purpose is one which, in physiological doses, will produce corresponding symptoms, *i. e.*, a purgative; but to give it in such doses would only aggravate the existing diarrhœa. It is necessary, therefore, to administer the drug in doses small enough to do no more than induce its first action, or contraction of the blood-vessels. The irritation is thereby arrested. But let a condition exist which requires dilatation of the blood-vessels for its relief, then a purgative in physiological or purgative doses is the proper remedy. Constipation is such a condition.

Take another analogous case. There are many points of resemblance between digitalis and the ergot of rye. Both produce general contraction of

the blood-vessels, and though the brunt of the former falls mainly on the heart, its action on the uterus closely resembles that of the latter. When we wish to check menorrhagia, or threatened abortion, we can find no better remedy than ergot, which, in small doses, contracts the uterine vessels; but when we wish to expel a detached ovum, a tumour, or a full-grown child, or to close the uterine sinuses in post-partum hemorrhage, the main remedy on which we rely is still ergot in physiological doses. Its first action of spasm is succeeded in these cases by dilatation of the uterine blood-vessels, and determination of blood to the organ. Muscular contraction accordingly takes place, whereby the contents of the cavity are expelled, or the sinuses closed. A large dose of ergot is often found to cure a simple menorrhagia, but this arises from the muscular contractions closing the dilated vessels, so that in either case a cure is effected, although it is quite unnecessary to give more than small doses, sufficient to cause spasm of the vessels without influencing the muscular fibre.

And so it is with digitalis in heart-disease. An hypertrophied heart is analogous to a uterus affected with menorrhagia; a dilated heart resembles the uterus suffering from inertia. The same remedy will benefit both conditions. In the former case, a minute dose is all that is required; in the latter, the physiological action must be induced. But just as purgation is a rough method of treating constipation, and only to be adopted as a temporary expedient, so the treatment of enfeebled heart may turn out but a rough process, to be superseded when we find better means of relief. At all events, in my practice, the increased strength afforded to the dilated heart has been always temporary, and entirely dependent on the continued administration of the medicine; while, in a month or two, most of the patients—and I have seen a good many—died in spite of the treatment. We all know how purgatives fail us more or less after a time.

Let me, in conclusion, give a few hints regarding the application of digitalis to the treatment of enfeebled heart. It must be borne in mind that, prior to its physiological action, it has a contractile influence on the cardiac blood-vessels. Some hearts are so enfeebled that, before the secondary effect of digitalis takes place, there is great risk of the primary contraction putting an end to their movements altogether. Two cases have come under my notice in which sudden death took place after one or two doses of digitalis, the pulse not being in the least degree altered till it failed. Several writers mention the same occurrence, and attribute it, I think properly, to the medicine. Dr. Wilks and others think, from their post-mortem examinations, that the sudden death should be set down to degeneration, and not to digitalis; but this only confirms the opposite opinion, for the more the heart is degenerated the more likely is contraction of its vessels to extinguish what movement it has. If the heart can stand out till reaction takes place, then much benefit is obtained, and the muscular tissue is strengthened; but if not, then sudden death will occur, or, at all events, great faintness and other alarming symptoms. There is thus very great danger in administering digitalis when the ventricle is very much weakened, even although its administration would be followed by relief to the symptoms. A careful examination of the heart is therefore necessary in all cases before prescribing such a dangerous drug. In those instances where degeneration is not much advanced, it may be given freely, but in other cases with the utmost caution, and in comparatively small quantity. As it is, however, commonly impossible, by mere physical examination, to determine the exact amount of change in the muscular tissue, it is better, in all cases, to begin with a very small dose. I commonly give ʒij. of the infusion, but the more I see of its effects, the more I am inclined to diminish the quantity still lower. I believe five drops of the tincture have caused alarming symptoms. The patient must be sedulously watched, with stimulants at hand in case of accident; and as soon as the pulse has become stronger and more regular, the medicine must be suspended, to be renewed after some days, if necessary. In most cases it will be found that the benefit is only temporary, for the organic change goes on, and destroys life sooner or later—in my experience within a month or two.

In some cases of hypertrophy aconite is preferable to digitalis, in doses suitable for the febrile state (gtt. ¼—gtt. j). They are those in which the circulation is generally active. Dr. Walshe approves of this remedy in such conditions. I have presently a patient under my care who keeps aconite always beside her, and when the heart beats tumultuously, gtt. ¼, taken in water, quiets its action. Hypertrophy, however, should generally be let alone; being compensatory, any interference with it might cause danger. Digitalis in small doses, or aconite as above, will, in most cases, quiet undue action.

I have little experience of the treatment of delirium tremens by digitalis. What I have leads me to the conclusion that it is useful only in asthenic cases, and dangerous when the pulse is full. The toleration by the system of large doses seems to be due to the counteracting effect of alcohol. At all events, the benefit derived is due to the physiological action of the drug; whether on the heart or on the brain, or on both, is unknown.—*Edinburgh Medical Journal, Sept.* 1868, *p.* 211.

25.—VERATRUM VIRIDE IN PERICARDITIS.

By Dr. J. Waring-Curran.

[Veratrum viride by its certain power, if carefully watched in its administration, of reducing the frequency of the pulse, and thereby affording relief to palpitation and tumultuous action, becomes a remedy of value in some cases of pericarditis.]

I invariably employ the extract—considering it the safest and surest preparation—made by inspissating the juice of the root, and prescribe it in two grain doses, with one grain of calomel in the form of pill, every two hours until its effects are readily discernible. The distressing symptoms are then kept at bay until the calomel does its duty, and the disease mastered. Advocates for local or, perhaps, general depletion, have only to observe its therapeutic influence once, to feel convinced that we *do* possess a remedy which will afford all the benefits to be obtained from either bleeding, leeching, or cupping, without impoverishing the blood and increasing the tendency to serious effusion, constituting *hydrops pericardii*, which has been unfortunately not an unfrequent consequence of this disease, particularly in hospital practice.

The history of the three following cases will impart all that I would fain convey on the subject:—

Case A.—R. R., aged 27 years, the subject of rheumatic fever, for which he has been under treatment six days; on the seventh day of his illness he presented all the well-marked symptoms of pericarditis. On going into the room I noticed that peculiar distressed, broken-hearted appearance of face so indicative of cardiac mischief; there was visible pulsation of carotids, hurried respiration, tumultuous action of heart, and *decubitus* on right side. He complained of severe lancinating pain extending up between the shoulder blades to the left side of neck, thence extending down the arm of same side; pulse 130; respirations 40; skin dry; tongue parched; secretion arrested; high fever. On practising auscultation, a well-marked *to-and-fro* sound is audible, all the unequivocal symptoms of acute pericarditis being present. I immediately put him on two grains of the extract of veratrum viride, and one grain of calomel, to be given in pill every two hours, with a potass mixture, and a mustard blister to be applied over the cardiac region.

Evening Visit.—Pulse 60; respiration 20; bowels have been operated on twice, bilious, feculent stools; passed a large quantity of acid urine; more free from pain, and expresses himself easier.

Owing to vomiting, which set in later in the night, I discontinued the veratrum, and prescribed an effervescing mixture containing dilute hydrocyanic acid.

The following day there was an aggravation of the symptoms—the veratrum was renewed, and steadily employed, discontinuing it when the symptoms required me, until a complete and satisfactory cure was effected. The

patient recovered without a bad symptom. and is now attending to his usual avocation.

Case B.—This was also a well-marked case of rheumatic pericarditis, presenting all the symptoms of the complication to a marked degree. The veratrum brought down the pulse from 120 to 70 in the course of twenty-four hours, increased the secretions, and produced a most desirable termination.

Case C.—Pericarditis with severe dyspnœa and violent inter-scapular pain; irregular pulsation and congestive tendency. The veratrum produced its usual effects, and, combined with the calomel, in a few hours alleviated the suffering of the patient, increased the secretions, and relieved the pulmonic circulation. The patient is now as well as ever he was.

In three cases of acute rheumatism, in which pericardial symptoms threatened, although did not positively manifest themselves, I feel assured that the mischief was baffled by the early and careful exhibition of ten-drop doses of the tincture of veratrum viride in the athritic mixture.—*Medical Press and Circular, Sept.* 9, 1868, *p.* 223.

DISEASES OF THE ORGANS OF RESPIRATION.

26.—ON TUBERCLE, ITS BIRTH, LIFE, AND DEATH.

[The following valuable article is by the Editor of the British and Foreign Medico-Chirurgical Review, and may be considered as a review of recent works on Tubercle.]

It may, perhaps, be well, before proceeding with our subject, to say a few words against the tendency, which has long and much prevailed, to regard diseases as strange entities, or to confound disease itself—a complication of effects produced by certain causes in the tissues of the body—with the causes of disease. Thus fallaciously guided, the student of biology, instead of being led step by step up a gradual ascent from the study of physiological to that of pathological processes, is made to spring over a wide gulf into a new and strange land. The truth is, that we pass by a scarcely perceptible transition from the phenomena of healthy nutrition to hypertrophy, inflammation, tubercle, tumours, fevers, and other forms of perverted nutrition or disease. A hypertrophy may be an excess of healthy nutrition, or it may be what we call disease; this distinction being not one whit founded on intrinsic differences, but being an arbitrary distinction of our own according to the usefulness or harmfulness, as observed by us, of the changes which take place. We see a blacksmith's arm enlarge as he works at his forge, and we see a thyroid or cervical gland enlarge from some cause which we cannot so clearly appreciate. We examine the condition of the tissues in both, and we find in both alike what we call hypertrophy or hyperplasia. The elemental increase in both is identical, but we call the one "healthy action," because we see why it occurs and what a useful purpose it subserves; while we denominate the other "disease," because we cannot see its purpose in the economy, and therefore regard it as hurtful. From hypertrophies to tumours is but another mere step or shade of gradation. Between certain tumours, in their early stage, and products of inflammation, no distinction can be made: and we shall hereafter see how identical in their structure are tubercles with products of inflammation on the one hand and certain tumours on the other. Hence, from the merest hypertrophy up to the most aberrant form of tumour, disease is nothing more than an unusual activity or perversion of the very changes which are ceaselessly going on in the nutrition of the body, and which constitute what we understand by the life of the individual.

Perhaps nowhere is the *birth* of tubercle better studied than in the pia mater of a person who has died of acute tubercular meningitis. A piece of this membrane, spread out and examined under a moderately high power of the microscope, is found to be the seat of an extraordinary cellular increase.

The cells and nuclei which mark this increase or proliferation are seen part scattered profusely and at random through the membrane, giving it the well-known milky appearance that it offers to the naked eye, part clustered into little whitish or grayish knots or particles—the individual tubercles. A close scrutiny of these latter will show that they are especially abundant along the smaller branches of the cerebral arteries, and seem here to take their origin in the cells of the connective tissue which composes the adventitia or outer coat of these blood-vessels. So markedly is this the case that, although the tubercle-cells must be allowed to arise from the connective-tissue-cells of the membrane generally, yet the adventitia appears to be certainly the part most actively concerned in their development. The tubercle-cells generally are rather smaller than a white blood-cell, have faintly granular contents, and are very brittle, so as very readily to rupture and set free their shining nucleus. Towards the border of the tubercle are seen cells larger than the above, often containing many nuclei, and manifestly representing connective-tissue-cells in a state of active hyperplasia or tubercular development. In and among the cluster of cells which compose the tubercle is a faint stroma, the original connective tissue, together with, occasionally, blood-vessels, not newly formed, for tubercle is non-vascular, but belonging to the tissue in which the tubercle arises. Very much the same appearance is obtained from fine sections of liver or kidney, and from serous membranes affected with tubercle, the connective tissue in all cases serving as the matrix for development. In the lungs, wherever connective tissue is to be found there may tubercles be present: but whether tubercle may also be developed out of the epithelium lining the alveoli and grow inside the air-cells, is a point on which we find our authors at issue. Virchow denies that the little deposits found *inside* the air-passages and air-cells are tubercles. For him these are mere products of inflammation or catarrh which choke up the small bronchi and, on section, so closely resemble tubercle proper that they may be called "spurious tubercle." He professes himself able to distinguish between these spurious tubercles and the true tubercles of the connective tissue, a distinction which, if it be real, must require unusual skill and assurance to make. Villemin, on the contrary, maintains that there are positive intra-vesicular tubercles, which are no more the products of catarrh than the extra-vesicular. Careful microscopical observation enables him to assert, that the fine wall which partitions off the air-sacs from one another is not a homogeneous membrane, but encloses in its substance a cellular element peculiar to itself. Under a high magnifying power a beautiful network of capillaries is seen covering this wall, between the meshes of which network he can detect a cellular element occupying nearly the whole of each open space. There is, he asserts, no epithelial lining to the alveoli, but the tubercles are formed out of the above cells, and grow into the cavities of the air-sacs, filling them up. Lebert, again, believes that pulmonary tubercles or granules, as he calls them, take origin indifferently in the cells of the connective tissue or in the epithelium of the alveoli, being both intra- and extra-alveolar. If, he says, you call the little particles outside the alveoli tubercles, you must call those that are within likewise tubercles. They are all a part of the same disease, a result of the self-same irritant. Bizzozero likewise holds that the little intra-alveolar masses which accompany tubercle are really tubercles and spring out of the epithelium that lines the alveoli. In the case of the lymphatic and ductless glands, Virchow, though he alludes on more than one occasion to the closeness of the link which binds the connective tissue with the lymphatic system, yet insists that it is in the connective-tissue-framework of these glands, not in the gland-cells, that the tubercles originate. But Villemin, looking at the connective tissue and lymphatics as parts of one great system, which he designates the "lymphatico connective system," believes that tubercle may originate both in the cells and in the connective tissue of the lymphatic and ductless glands. Hence, in tubercular disease of these organs, the microscope cannot of itself distinguish tubercle from simple hyperplasia, inasmuch as elements identical with those already existing in health are simply reproduced in excess. It is, consequently, a matter of extreme diffi-

culty, nay, in some cases impossible, to say whether a given change in one of these glands is simple hyperplasia or tubercle. This question, then, must remain for the present an open one. That tubercle originates mainly in the connective tissue is the expressed opinion of all these modern authors. That it may also find a nidus of development in epithelium and gland-cells is probable, but not yet clearly determined.

Tubercle has the shortest *life* of any pathological product; it is born but to die. Hence its power of growth is exceedingly limited, and its hurtfulness, when solitary, but small. Herein, however, consists its deadliness—that it is the expression of a general disease; that the same cause which produces it is circulating through the body, and may produce thousands similar to it wherever connective tissue is present; and that it has, as Virchow was the first to point out, manifestly malignant properties, spreading to the tissues in its neighbourhood and infecting distant organs by dissemination of its germs or juices. Thus, though there is a marked limit to the size of the individual tubercle, there is no limit to the size of the masses that are formed by agglomeration of tubercles, or to the number of tubercles which may be scattered through the body. Do we not see in these properties something that reminds us of the outbreak of an eruptive fever, and something, too, that recalls the behaviour of cancer?

An early *tendency to die* is, then, the most characteristic and distinguishing mark of tubercle. Fatty degeneration, beginning first at the centre of the knot, gradually spreads to the circumference, and gives it the well-known yellow colour from whence the name of "yellow tubercle" is derived; till, little by little, the whole particle softens and breaks down into a "cheesy" granular *débris*. We have, therefore, but to picture to ourselves a large cluster of tubercles passing through this change in the midst of some organ, as the lung or the kidney, in order to understand what wholesale devastation may be thus wrought, and how a cavity or "vomica" may be formed, in which are contained the remains of the softened tubercles, and of the broken-down tissue involved by the tubercles in destruction. On the other hand, if the part diseased be a free surface (as a mucous membrane), the disintegration and softening of the tubercular mass will give rise to the formation of an ulcer which differs from the ordinary process of ulceration by the fact that the base and sides of the ulcer are walled in by the remaining tubercular matter.

Foremost among *the diseases which, either anatomically or clinically, bear decided marks of relationship to tubercle*, stands scrofula. The word "scrofula" seems to have been originally employed to designate a chronic swelling of the cervical lymphatic glands, in consequence of which the neck loses its contours and comes to bear some resemblance to the neck of a "scrofa" or pig. It was then noticed that certain eruptions of the skin or affections of the mucous membrane were accompanied by this same glandular enlargement, and it was agreed to include them too under the title of scrofula. After a while, it followed that every glandular enlargement, no matter where situated, must be a manifestation of scrofula. Certain internal glands, as the bronchial or mesenteric, were now observed to be often in a state of hypertrophy and cheesy degeneration, while, at the same time, tubercles were present in the lungs or bowels. What more natural than to look at the ganglionic lesion and the tubercular products as the common effects of the same cause, scrofula? The thing seemed clear enough, especially when the French school detected the same "specific cells" in the cheesy scrofula of the glands as had been found in the cheesy tubercle of the lungs and intestines. Thus the terms scrofulous and tubercular came to be synonymous, and a scrofulo-tubercular diathesis was a convenient refuge for the destitute in all doubtful cases. Gradually, however, facts in contradiction of this view began to accumulate, and to be noted down by independent observers. Foremost among those who combated the identity of the two diseases was our own Jenner, whose masterly exposition of the subject (Med. Times and Gaz., March, 1860), is well known to all. Virchow at the same time completed Jenner's clinical picture by upsetting the doctrine of specific tubercle-

elements, and showing that the cheesy metamorphosis is peculiar neither to scrofula nor yet to tubercle, but is met with as a termination of simple inflammation, of syphilitic tumours, of farcy-buds, and sometimes of cancer. Both Virchow and Villemin look on scrofula and tubercle as distinct things. In the opinion of both pathologists, scrofula signifies a weak, "impressionable," or "vulnerable" state of the body, in consequence of which, irritants act upon the tissues with unusual severity and *persistence*. From this point of view, a simple glandular swelling following an ordinary irritant is not scrofulous; but when a superficial irritation of the skin or mucous membrane *persists*, and is followed by swelling of the adjacent glands which likewise *persists* even after the primary irritation has been removed, we have a scrofulous person before us. Three great groups of glands may thus be affected with a scrofulous or chronic change,—the cervical, the bronchial, and the mesenteric. Villemin is of opinion that no anatomical distinction can be made between the scrofulous and tubercular gland; that in both there is simple hyperplasia with a retrograde tendency. He thinks that it is in the exciting cause that the true distinction is to be sought; scrofula being a mere tendency to chronic glandular enlargement in consequence of slight external and *local* causes or irritants, in a child whose lymphatic system is unusually impressionable; tubercle being, on the contrary, due to a specific cause or virus which provokes a more *general* outbreak. That which holds good for the glands holds good equally for the bones, in which scrofulous disease is a mere chronic and very persistent inflammation, while tubercular disease is a specific lesion. Scrofula is, further, a disease almost peculiar to childhood; it is, therefore, intimately connected with the development of the body, and manifests its presence at a time when the lymphatico-connective system is in the zenith of its functional activity. Tubercle, on the contrary, prevails between twenty and thirty, at an age when scrofula has ceased to disturb the body. Scrofula is not hereditary as a disease; but the exaggerated lymphatic vulnerability which favours its attack is strongly hereditary. Virchow goes still further, and finds a positive anatomical difference between the scrofulous and tubercular lesion in the diseased gland as well as in the lung. In the gland, scrofula is for him a simple chronic hypertrophy of the glandular tissue generally, with a tendency to "nekrobiosis" or degeneration; tubercle is a true neoplasm forming in the connective tissue only of the gland and not involving, save by extension, the proper glandular structure. In the lung, tubercle is in the connective tissue alone; scrofula, or "scrofulous pneumonia," is a chronic inflammation of the bronchi and air-cells, which become stuffed up with their accumulated contents in a state of cheesy degeneration, and form cheesy deposits of larger or smaller size according to the extent of the inflammation. No one who has had much to do with children's diseases can hesitate to accept the accuracy of this distinction. These cheesy patches in the lungs, accompanied by cheesy degeneration of the bronchial glands, without a trace of anything like a tubercle in any part of the body, are, from time to time, met with. We cannot avoid, therefore, accepting a scrofulous pneumonia in youth as distinct from tubercular disease. At the same time we agree with Villemin that Virchow and his followers ride their hobby a little too hard in the case of the cheesy infiltrations which accompany real tubercular disease in adults. These, the Germans assert, are not softened tubercular masses but are mere patches of chronic inflammation that accompany the tubercles, and have passed through the same cheesy metamorphosis that tubercle itself undergoes. It is in vain that you put before them their own assertion that degenerate products of inflammation and degenerate tubercle are exactly similar in appearance, and that these patches are, therefore, at least as likely to be tubercles as inflammatory products, or that you point to the tubercles grouping themselves around these patches as if ready to form fresh ones. You are told that what you see are not tubercles, but sections of small bronchi filled with catarrhal accumulations. Lebert simplifies this matter most agreeably by assuming that there is no such thing at all as tubercle, but that all these deposits, intra- and extra-alveolar, miliary and diffuse, grey and cheesy, are nothing but inflammatory products. We shall return to this

difficulty under the head of inoculation. It is thus seen that tubercle and scrofula, though they have, anatomically considered, certain marked affinities with one another, are yet essentially distinct diseases.

It is in *glanders* that Villemin thinks he has found the closest marks of analogy with tubercle, not only in its anatomy, but also in its symptoms and causation. He seems to have been conducted from the study of glanders direct to the inoculation of tubercle. The characteristic lesion of glanders is a small tubercle which is strewn either in the mucous membrane of the nasal passages, or in the lungs, or, more rarely, in the liver and spleen. At first, a greyish-white firm granulation, composed of cells and nuclei apparently developed by hyperplasia of connective tissue, it soon tends to soften centrally and form ulcers on the mucous membrane, cavities in the lungs. Like miliary tubercle, it occurs isolated or in clusters. Together with this little granulation, streaks and bands of fibrous tissue, as well as patches of cheesy infiltration, are not infrequently met with in the lungs of glandered horses. It is interesting, too, that the same doubts have been raised concerning the real nature of these "infiltrations" in glanders as in tubercle. They are regarded by Villemin as one form of glanders, just as in man they are one form of tubercle. As to which is the part primarily affected in glanders—the nasal membrane or the lungs, there is some difference of opinion; Virchow maintaining that the deposits in the lungs are always secondary and by metastasis from the nasal membrane; Phillippe and Bouley being convinced by repeated post-mortem examinations that the primary lesions are always in the viscera, more particularly the lungs, and that the formations in the nasal membrane are invariably secondary. If, say they, a horse has the "jetage" (discharge from the nose), he is already thoroughly glandered. It really matters very little which part of the body is first affected. In either case the analogy with a tubercular outbreak remains as strong as can be. The intestinal ulceration of tuberculosis—in which we see the counterpart of the nasal ulceration in glanders—is more often secondary to the pulmonary disease, but occasionally shows itself before any evidence of mischief can be detected in the lungs. Again, glandular enlargement of a severe and persistent kind, constitutes an important part of glanders as it does of tubercle. The mode of invasion is likewise identical in the two diseases; now acute, foudroyant, destroying life in a few days as by an overwhelming blood-poison, now chronic so as to last for years. Further, in the chronic form, the same recurrence of acute attacks complicating and adding to the chronic mischief is observed in glanders as in tuberculosis. To read a description of chronic glanders is, *mutatis mutandis*, to read an account of chronic phthisis. It is, therefore, not surprising that Dupuy goes so far as to say that glanders is a tubercular disease in the horse. In speaking of the supposed causes of tubercle, we propose presently to follow out still further this remarkable thread of resemblance; but for the present it will suffice to say that glanders is transmissible by inoculation, and contagious from horse to horse, and that it is also unmistakeably communicable from horse to man. Can we hesitate to believe, says Villemin, that the parallel between tubercle and glanders must here find its completion? To conclude, glanders and tubercle are so closely akin that they must be looked upon as nearly related species of the same genus.

Syphilitic formations have in certain organs, more particularly the brain, so close a resemblance to tubercle that the one may well be mistaken for the other. We see in both, the same little cells and nuclei forming apparently by proliferation of the connective tissue and heaped together in an intercellular substance; in both, too, a tendency to fatty degeneration, though less prominent in the syphilitic gummy tumour than in the tubercular deposit. Syphilis must therefore take its place with glanders and tubercle as one of a family.

Who is there that has watched a case of acute tuberculosis from its outset, but must have been impressed with the remarkable similarity that it bears to the eruptive fevers, and, more especially, *typhoid fever*. It is, indeed, doubtful whether in the first few days of the attack it be possible to make a diag-

nosis in such a case. It is only as the disease makes progress that special symptoms declare themselves, which enable a careful physician to recognise the presence of this most deadly of diseases. The question as to how far tubercle and typhoid fever are antagonistic is disputed. Villemin is strongly in favour of such an antagonism. He maintains that those who speak of fever as a frequent precursor of tubercle have been led into error by the great likeness of acute tuberculosis in its early stage to typhoid fever. What they have witnessed has been tuberculosis throughout, and not fever followed by tuberculosis. Murchison's authority is as strongly against any such antagonism. He says:—"Whether it be true or not that persons labouring under phthisis are rarely attacked with pythogenic fever, an attack of pythogenic fever is often followed by tubercular deposit in the lungs." But this is certain, that the post-mortem appearances in the liver, spleen, kidneys, and intestines of persons who have died of acute tuberculosis have sometimes a most striking resemblance to the appearances in the same organs after death from fever.

From *cancer* in its early stages tubercle in its early stages is structurally indistinguishable. Both take origin from the connective-tissue-cells, and tubercle has been already shown to have malignant properties which assimilate it to cancer. There are, likewise, cases of acute general cancerous eruption which have some points of resemblance to acute tuberculosis. Cancer, however, has an innate vigour and power of growth which sufficiently characterise it as contrasted with the sorry degraded tubercle and its kindred.—*Brit. and Foreign Medico-Chirurgical Review, July*, 1868, *p.* 27.

27.—ON THE NATURE AND TREATMENT OF PULMONARY CONSUMPTION, AS EXEMPLIFIED IN PRIVATE PRACTICE.

By Dr. Charles J. B. Williams, Consulting Physician to the Hospital for Consumption at Brompton; and Dr. Charles Theodore Williams, Assistant-Physician to the same Hospital.

[The development of pulmonary consumption seems to have been determined by inflammation in some form in about 30 per cent. of cases. A predisposition or dyscrasia is however generally required to give to inflammation this peculiar result.]

We have before alluded to the modes in which the consolidation of the lung induced by pneumonia or pleuro-pneumonia may terminate in phthisis, either acute or chronic. We shall here advert only to the chronic results. The exudation material thrown out by the inflammation fills and obliterates more or less of the air-cells of the lung, and converts the tissue into a tough solid, impervious to air, and incapable of carrying on its proper function. This cacoplastic deposit, being usually of a contractile nature, tends in time to shrink further, so as to still more diminish the volume of the affected lung, and to prevent its taking part in the respiratory movements. All that these movements can do, to draw air into the lung thus obstructed, is to dilate the bronchial tubes that remain pervious; and this general dilatation of the bronchi is commonly found in connexion with this chronic consolidation of the lung. This appears to be identical with the affection described by Sir D. Corrigan as *cirrhosis of the lung;* and more recently by Dr. Andrew Clark as *fibroid phthisis*. Its inflammatory origin is generally to be traced both in the history of the case and in the fact that the undoubted products of inflammation are always found in conjunction with it in the pleura, which is firmly adherent to the lung by a tough fibrous material like that pervading the condensed lung.

But this change of structure is truly also a step towards phthisis; for it not only abridges the function of the lung as an organ, but it brings a part of its material into a lower state of organisation, and therefore more prone to decay; thus the whole system often sympathises with it, convalescence being imperfect, with a tendency to continued loss of flesh and strength. A person in this condition, under circumstances trying to the general

health—ill-fed, ill-lodged, imperfectly clothed, confined in impure air, or exposed to cold, damp, or sudden change of atmosphere, and the like,—is pretty sure to go into consumption. The cacoplastic deposit in the affected lung undergoes further degeneration and softening, miliary tubercles form in the other lung, and the disease runs its course.

But if placed in *favourable circumstances*, such cases may very commonly be saved from this fate, and restored, if not to perfect health, yet to a state compatible with life and moderate activity and enjoyment for many years. The following cases are a few out of many that might be adduced to exemplify this statement. The first is given as an instance of inflammatory consolidation, with its concomitant dilated bronchial tubes degenerating into phthisis. Then follow others in which this issue has been hitherto averted, and the patients restored to fair health. And lastly, there are mixed cases, in which the phthisical disease has proceeded even to the formation of cavities, and yet it has been subsequently arrested; but the cicatrisation of cavities and the contraction of the indurations around them have ended in a condition more allied to habitual asthma, comprising more or less pulmonary emphysema, which has a mechanical influence in restraining further solid deposits in the lungs.

Case 29.—A lady, aged 35, was first seen Dec. 14th, 1841. Had three children and four miscarriages. Had suffered from phlegmasia dolens, mammary abscess, and other puerperal complaints. Twelve years ago had right pleurisy; and ever since breath has been short, with some cough. Suffered lately from pain and tightness in the chest. Occasional hæmoptysis to the amount of several ounces. Has been often bled for the tightness of the chest, and with much relief; but has lately become very pale and weak. Cough has increased, and is occasionally accompanied with profuse mucopurulent expectoration and night-sweats; aphonia; pulse 120. Physical signs: Dulness throughout right chest, especially in the lowest parts, where there is little motion. Tubular breath in middle, front and back. Cavernous sounds in lower back. Subcrepitus under left clavicle; breathing puerile below, throughout left chest. Heart beating under sternum. Liver enlarged. Ordered iodide of iron with tincture of hops, and aconite ointment for neuralgic pain.

March 8th, 1842. In the country, and improved in breath and colour, but lost flesh, and in last few days had pain and œdema of left leg. Cough better, with expectoration more mucous and slightly tinged with blood. Physical signs: Breath and voice loudly amphoric in lower right back; obscurely vesicular above, but shortened. Right front very resonant, with loud cough, and tubular breath. Tubular sounds under left clavicle. Dyspnœa and weakness increased, with extensive œdema in both legs up to the abdomen; and she died on the 11th of June.

On post-mortem examination, the left lung was found to contain scattered grey tubercles in the upper lobe, and a small cavity, with broken-down walls, at apex, where the lung was adherent to the chest. The right lung was adherent on all sides, except in front; adhesions being tough and firm, especially that connecting the lung with the diaphragm. The tissue of the lower lobe was solid, tough, and of a dark-grey colour; the bronchi greatly dilated, even to their ends. In the posterior portion was a well-lined cavity, of the size of a large egg, containing purulent fluid, and communicating by three round openings with dilated bronchi; a similar cavity at the base of this lobe. The middle lobe was very emphysematous and flaccid in front, but consolidated behind, and contained nodules of grey tubercle. In the upper lobe was a cavity of the size of an orange, with grey irregular walls, containing broken-down tubercle. The rest of the lung was in a state of grey consolidation, which in some parts had become yellow and softened. The large bronchi were very red.

In this case the contractile consolidation of the lung, resulting from inflammation twelve years before eventually went into tuberculous degeneration. This case occurred before the use of cod-liver oil was well known, and may be contrasted with the following examples.

Case 30.—A gentleman, aged 43, was seen by Dr. Williams for the first time on May 1st, 1855. Had been closely confined to business, but pretty well till February, 1855, when he was chilled, and a few days afterwards attacked with cough, shortness of breath, and then with severe pain in the loins and lower chest, and inability to lie on the left side. Expectoration has nearly ceased, but cough continues; breath is very short, and he looks miserably thin and pale, yet he is engaged to be married very shortly. The urine contains much brown sediment. Physical signs: Left side generally contracted, hard and dull: no breath-sounds audible in lower regions, but some below the clavicle; large tubular sounds and strong vocal vibration in middle regions; heart drawn up above fifth rib to the left. Has been taking citrate of iron and quinine. Ordered oil, in a tonic of nitric and hydrocyanic acids, with tinctures of hop and orange. An effervescing saline to be taken at night, and tincture of iodine to be applied to the chest.

July 7th. Has been taking oil three times a day, with acid and quinine, and is much improved in flesh and strength. Is free from cough, and expectorates but little; but still has pain in the left side. Physical signs slightly better, but still great contraction and dulness of this side. Ordered to take oil, with iodide of potassium, and to continue counter-irritation.

Dec. 29th. Was married in the middle of July, and has continued to improve, taking oil regularly, and gaining much in flesh, strength, and breath. Has had slight cough during the last ten days. Physical signs about the same.

May 26th, 1856. Had cold and cough for some weeks in the winter, and expectoration has continued since. Flesh and strength good, and breath better, though still short. Physical signs: Still dulness and collapse in left side of chest; but more vesicular breath in upper portion.

Oct. 23rd, 1862. Has been quite well, and has three children. Had lost cough, but breath remains short on exertion. Lately, at Scarborough, got chilled, and cough has returned, with yellow expectoration, and furred tongue. Physical signs: Still defective motion and breath in left chest; obscure in back and side; tubular voice at and above the scapula. Heart adherent to chest; impulse strong, less from hypertrophy than from the closer contact even of the left ventricle with the chest wall.

This patient has not been since heard of, but is supposed to be living, although there was still the danger of the cacoplastic deposit in the left lung further degenerating, and passing into the pthisical course.

Case 31.—Mr. ——, aged thirty-nine. Grandmother died of phthisis.

September 19th, 1856. Two months ago, after much exertion, he had a fever which was called gastric, but it was accompanied with cough and expectoration, once bloody, and the cough has continued, with opaque sputa; and although he has regained some strength, he has not recovered flesh, and sweats much at night. Physical signs: Defective motion, and extensive hard dulness over the whole right chest—most in upper parts, where there are large loud tubular sounds, and strong vocal vibration. Some crepitus in the lower parts, but no vesicular breath-sound. He had been taking cod-liver oil, a dessert-spoonful twice a day; to be increased to a table-spoonful, and taken in infusion of orange peel with sulphuric acid.

October 13th. Cough less, and improved in strength. He passed the next winter at Rome, with little improvement, the emaciation, cough and expectoration continuing, and the state of the lung much the same—extensive consolidation, but no decided softening or excavation. The winter 1857–8 was spent at Nice, and during this year a gradual improvement took place in flesh; the patient gained nine pounds, and the cough and expectoration ceased. Physical signs: Still much dulness, and tubular sounds in right back and front, but more motion and breath.

Oct. 4th, 1859. Last winter in Rome, with more strength and activity. Is much less thin. Has been lately at Spa, and suffered from rheumatism of the back, and sweats. Physical signs: Motion and sound on percussion much improved in right chest, but there are still some dulness and large

tubular sounds at and above right scapula. To take mixture of iodide of potassium and quinine, with nitric acid.

December 6th, 1860. Has been generally well, except occasional pain in the right chest, and perspiration on exertion. Physical signs: Movement and stroke sound of the right side still not equal to those of the left, and some tubular sounds remain in the scapular region; but there is good vesicular breath sound elsewhere.

1866.—Quite well in health. Still some tubular sound and dulness in upper right.

1868.—Continues well.

I apprehend that most practitioners in this country are agreed in considering that consumption should be generally treated on a tonic and sustaining plan; and that the nourishment and strength of the system should be supported by varied tonics and cod-liver oil, as well as by the most nutritive articles of diet. But when the disease is ushered in with symptoms of acute bronchitis or of pneumonia, with its attendant fever and scanty disordered secretions, it is obvious that such treatment is wholly unsuited for the occasion; and that remedies of the mild antiphlogistic kind, such as salines, with or without antimony, blisters, and cataplasms, and sometimes even moderate leeching or cupping, will give most relief, and will prepare the patient for the safe administration of the sustaining class of remedies.

The great remedy, more essential and more effectual than any other, is the cod-liver oil; and we may well bestow a little consideration on the mode of using it to the best advantage.

It is now pretty generally admitted by the profession that the pure, pale oil, simply extracted from the fresh, healthy livers of the fish, is that most suitable for the majority of patients, as being less unpalatable and at least as efficacious as the impure kinds. Since I first recommended this pure oil (*London Journal of Medicine*, January, 1849) it has been so extensively prepared and used that it is now one of the most important articles in the materia medica; and the universality of its introduction is a strong proof of its claim to public favour.

On the mode of operation of the oil, and on the best methods of administering it, I have little to add to what I have published twelve years ago ("Principles of Medicine," 3rd edit., p. 487). To that I must refer for details which would be too long for quotation here; but I may give the following brief summary of my opinions and experience on the subject.

Cod-liver oil, when taken into the system in sufficient quantities, and for a sufficient length of time, acts as a nutrient, not only adding to the fat of the body, but also promoting the healthy growth of other tissues, and in some way, as an alterative, counteracting the morbid tendency to the proliferation of the decaying cells of pus, tubercle, and kindred cacoplastic and aplastic matters.

That its efficacy depends much on its being absorbed freely into the blood, and through the circulation pervading all parts of the body, and thus reaching to the very seat of morbid deposits and formations.

That the more fluid part of cod-liver oil surpasses all other oils and fats in the facility with which it forms emulsions, which are tolerated by the stomach and readily absorbed into the blood, without causing the nausea and bilious derangement that commonly result from an excess of fat food. This peculiarity may depend on the biliary and other matters contained in the oil, which in other instances of disease is found to act beneficially on the liver and other secreting organs.

That the best time for the administration of the oil is immediately after, or, to those who prefer it, at or before, a solid meal, with the constituents of which the oil becomes so intimately blended that it forms a part of the chymous mass, and is less likely to rise by eructation than when the oil is taken into an empty stomach. From this chymous mass, the oil being absorbed through the lacteals with the chyle, is less apt to disorder the liver than if absorbed through the veins of an empty stomach.

That as the use of the oil should be continued for a long time—perhaps

for months, or even years—it is of great importance to conciliate both the palate and the stomach by giving it in a vehicle which may agreeably disguise its flavour and strengthen the stomach to bear it. For this purpose an aromatic bitter, such as the compound infusion of orange-peel, acidulated with a mineral acid, both to help to cover the taste of the oil and also to suit the stomach, which should be duly supplied with acid during digestion, generally answers well. Syrup may be added according to the taste of the patient; or, still better, some bitter tincture, such as calumba, cascarilla, or quinine, in every case in which it is desirable to improve appetite and tone. In cases of peculiar weakness of stomach, with tendency to retching or nausea, strychnia, in a dose of from $\frac{1}{32}$ to $\frac{1}{24}$ of a grain, proves a most valuable adjunct to the vehicle. By its means I frequently overcome the fastidiousness of stomach arising from debility, hysteria, or indulgence in alcoholic liquors. Salicine is another efficacious alternative of the same kind. Either of these, although a powerful tonic, has none of the heating properties of quinine or iron. When the strong bitter taste is objected to, a pill, containing extract of hop or chamomile, or salicine, or quinine, may be taken after, or before, the oil and its vehicle.

The bulk of the whole dose of oil and vehicle should be small, so that it may be swallowed at a single draught; therefore the vehicle should not exceed a tablespoonful, with, at first, a teaspoonful of oil, to be gradually increased to a tablespoonful. The dose of oil should rarely exceed a tablespoonful twice or thrice daily: when a larger amount is taken at a time, generally either it deranges the stomach or liver or some of it passes unabsorbed by the bowels.

The acid may be varied according to circumstances. The nitric generally suits best in inflammatory cases, and those attended with much lithic deposit in the urine; but its tendency to injure the teeth is an objection to its long continuance. The sulphuric is more eligible where there is liability to hæmoptysis, profuse sweats, or diarrhœa. But in most cases, and for long continuance, I have found reason to prefer the diluted phosphoric acid, which may be termed the most physiological of the acids, tending to derange the chemistry of the body less than the others.

With some individuals the oil agrees so well, and so much improves their digestive powers, that they require few or no restrictions in diet; but this is not the case with the majority. The richness of the oil does prove more or less a trial, sooner or later, to most persons; and to diminish this trial as much as possible, it obviously becomes proper to omit or reduce all other rich and greasy articles of food. All pastry, fat meat, rich stuffing, and the like, should be avoided; and great moderation observed in the use of butter, cream, and very sweet things. Even new milk in any quantity is not generally borne well during a course of oil; and many find malt liquor too heavy, increasing the tendency to bilious attacks. A plain nutritious diet of bread, fresh meat, poultry, game, with a fair proportion of vegetables, and a little fruit, and only a moderate quantity of liquid at the earlier meals, commonly agrees best, and facilitates the continued exhibition of the oil in doses sufficient to produce its salutary influence in the system.

In case of a bilious attack coming on, indicated by nausea, headache, furred tongue, offensive eructations, high-coloured urine, and sometimes pain and tenderness of the right hypochondrium, it is necessary to suspend the oil, lighten the diet of the patient, and give blue pill or calomel with an aperient on alternate nights, and an effervescing saline two or three times during the day. A few days of this treatment will generally set the stomach and liver to rights, and the oil may be resumed, beginning with small doses as at first. In all cases during the use of the oil the bowels should be kept regular in action; and if this cannot be done by regularity of habit and diet, it should be effected by the use of a mild daily pill of rhubarb or aloes.

Such are the directions which have proved most effectual in the administration of a remedy which may truly be said to have so much altered the prospects of the consumptive as to give hope of cure in not a few, and of much prolonging life in by far the greater number. But to induce patients

to follow these directions, and to overcome their aversion to a remedy which the prejudice of some represents as disgusting, and the experience of many may find trying to continue for so long,—the practitioner will often find it necessary to use all his powers of argument and persuasion. The great plurality of patients are amenable to reason. and are willing to follow any advice that is given with *confidence* and *clearness*. To those who demur or rebel it is generally expedient to tell the plain truth—that they have a serious disease, pretty sure to increase, and sooner or later to destroy life, if left to itself; but *here is the remedy*—the only one worthy of the name, which if carefully and faithfully used may arrest and cure the disease, and is pretty sure to retard it and prolong life more than any other known means. If the physician believes this himself he will rarely fail to carry his patients with him. I believe it firmly, and I rarely fail to make the patient take the oil, and to persevere with it, in the experience and conviction that it is essential to his well-being and improvement. The proportion of recusants, either from waywardness of temper, fastidiousness of taste, or from intolerance of stomach, altogether does not exceed five per cent.

Although my long experience assigns to cod-liver oil a place far above all other remedies in the treatment of pulmonary consumption and its allied maladies, it has taught me to believe also in the limited efficacy of certain other agents.

[Before the introduction of cod-liver oil a combination of iodide of potassium and nitric acid, with a vegetable tonic, was frequently prescribed in consumptive cases, and was productive of some good. This Dr. Williams still uses in the rare cases in which the oil disagrees. The hyposulphites of soda and lime, so strongly recommended by Dr. Churchill of Paris, has in the author's hands proved decidedly beneficial in certain cases. These hyposulphites seem to increase the failing powers of respiration and circulation.]

Perhaps the efficacy of the sulphurous acid—Dr. Dewar's remedy for consumption—may depend on an influence not altogether unlike that of the hypophosphites. My experience of the use of the spray of sulphurous acid is limited in phthisis, and as far as it has gone has not been very encouraging. But I have found the spray a most useful and agreeable remedy in various affections of the throat, whether diphtheritic or aphthous; and it has proved cleansing and soothing in some cases of foul ulceration of the throat, affecting both larynx and fauces, generally syphilitic in origin, and sometimes ending in pulmonary consumption.

In connexion with this subject, I must notice remedies administered by inhalation, which are really useful in certain cases, chiefly those in which the larynx and trachea are much affected, and in those attended with convulsive cough or offensive expectoration. I have generally found the use of inhaling instruments fatiguing and unnecessary. A quart jug of hot water, with a napkin from over the nose down to and around the jug to confine the steam, is all that is needed. To the hot water is added the drug to be inhaled; and creasote or carbolic acid, iodine, chloroform, oil of turpentine, and juice or extract of hemlock, are the articles which I have found most beneficial. A few drops of one, or of several of these combined being put into the hot water, the inhalation is practised through both mouth and nostrils without restraint or difficulty, and may be continued for five or ten minutes every night, and, if need be, repeated once or twice in the day. Although the chief operation of this medicated vapour is on the guttural and bronchial surface, yet a portion penetrates into the lungs, and is absorbed into the system: for iodine and oil of turpentine can be detected in the urine within a few minutes of the inhalation being made. Still, although proving very serviceable in certain cases, I cannot rank inhalation higher than as a subordinate remedy in the treatment of consumption. I may add, that the practice of painting the chest with tincture of iodine every night, as a gentle counter-irritant, is not without a certain influence in the way of inhalation; for a portion of the iodine evaporates, and slightly impregnates the air around the patient, and this atmosphere of iodine may not be without its influence for good.

Of far more importance in the treatment of consumption is change of air

and climate. It is of the greatest consequence to the phthisical invalid that he should breathe as pure air as possible, and that the influence of this pure air on the blood and on the body should be increased by such gentle and varied exercise in it as his strength and the condition of his organs will permit. This is the great object of our sending him to a warm climate in winter, and to a high and dry locality in the summer, that he may be as much as possible in the *open air*, with its exhilarating and vivifying accessories of light, purity, and freshness, without the chilling operation of cold and wet in the winter, and the enervating and exhausting influence of oppressive heat in the summer.

In conclusion, I trust that the preceding paper has proved that, powerless as medicine is in the overwhelming and rapid types of pulmonary consumption, it has yet considerable influence over the milder forms; and *that under careful treatment life may be prolonged for many years in comfort and usefulness, and in not very few cases the disease is so permanently arrested that it may be called* CURED.—*Lancet, July* 4, *and August* 15, 1868, *pp.* 3, 211.

28.—MORBID CONDITIONS OF THE THROAT IN RELATION TO PULMONARY CONSUMPTION.

By Dr. S. Scott Alison, Physician to the Hospital for Consumption and Diseases of the Chest, Brompton.

[The relations which have been held to subsist between disorders of the trachea and adjacent parts, and pulmonary consumption, are four in number —1. That of a precursor; 2. That of a coincident; 3. That of a sequela; and 4. That of a stimulator.]

In the first stage of phthisis the non-implication of the trachea and adjacent parts is most common, and even in such cases a majority will show a not entirely healthy condition of the parts in question. In the second stage a much larger proportion of cases is found to be implicated with these minor affections; and in the third, nearly every case reveals, either by the voice or by respiratory auscultatory signs, evidence of the implication of the windpipe. The task of connecting the disorder of the trachea with the more grave disease of the lung in such cases is, on the whole, an easy one. If there be any difficulty it is in cases of phthisis in its first stage. The aberrations from the healthy amount and quality of the respiration sounds of the chest, serve at once, in the later stages of pulmonary consumption, to indicate the dependence of the minor disorders upon pulmonary mischief.

Of twenty-six cases of all forms of phthisis in all stages of the disease now in the hospital at Brompton, under my care, nineteen, or 73 per cent., give full evidence of disorder of the upper air-tube apparatus.

Some of the local complications are grave, whilst others are of less serious significance.

Of eighteen cases of phthisis in the third stage, only three are free from implication of the trachea, and other parts of the upper air-tube apparatus. These figures give a percentage of 83.

The diseases of the trachea, larynx, and adjoining parts, which we observe in pulmonary consumption, are almost invariably found to hold this relation, viz.—that of sequela. In examples of acute pulmonary consumption, it is consistent with my observation to say, that the disorders of the windpipe, &c., that occur, depend upon the extension to the parts first involved, of that tubercular vascular over-action which originated in the lungs. This morbid action is propagated by continuity of structures.

In chronic cases of phthisis, the disorders of the trachea, larynx, and adjoining parts, seem to proceed from the production of congestive action from neighbouring irritative disease, and in the second and third stages from inflammatory conditions, sometimes simple and sometimes tubercular, caused by the actual passage of irritant secretions, and the *debris* of destroyed material from the diseased lung, over hitherto healthy parts.

The morbid alterations of structure which I have observed in the trachea and the adjacent parts, in pulmonary consumption, are various. These conditions are often simply an injected and turgid, and somewhat swollen state of the mucous membrane of the rima of the glottis, the epiglottis, the tonsils, and the posterior wall of the pharynx, and of the larynx and trachea. These parts may be all equally affected, but it is more frequently the case that only some parts are materially involved. In the more advanced cases of phthisis the larynx and trachea are chiefly diseased, but in many examples, rapidly progressing to a fatal issue, all parts are implicated. Red and injected conditions, with small elevations of swollen glandules of the posterior wall of the pharynx are common. Indented or serrated conditions of the epiglottis are often presented, and a thin and shaven-off like edging is not unfrequent. A red and scarlet state of the epiglottis, resembling the petal of a scarlet geranium, is often met with. The larynx is often inflamed, congested, ulcerated, and totally, or almost totally, deprived of its vocal cords. A very general condition, in extremely bad cases, is one of total loss of the cords, with deep ulceration between the thyroid and cricoid cartilages, and a general ulceration, and rough or granulated surface of the entire mucous membrane of the larynx.

The symptoms during life attending the allied disease of the trachea, &c., are, in slight cases, huskiness and occasional hoarseness, sense of irritation in the throat, and more or less frequent attempts to clear the parts of mucus, producing a sound like the word "hem," more or less forcibly formed. The hoarseness frequently becomes continuous, and when ulceration of the larynx is extensive, aphonia or whispering is produced. When the vocal cords are totally destroyed, the aphonia is complete, and the attempt to speak simply produces a roaring and inarticulate sound, very painful to hear. In these latter cases deglutition is painful, and when the epiglottis is greatly ulcerated, particles of food are wont to fall into the larynx and to give rise to partial suffocation, and to severe local convulsive efforts.

An œdematous state of the rima glottidis is occasionally found in the last stages of pulmonary consumption, and this gives rise to great difficulty of respiration. The lung is not duly inflated, and it is impeded in the expulsion of its æriform contents. The voice is destroyed, or becomes whispering, and the sound of respiration, heard through the medium of the open atmosphere, or through the stethoscope placed upon the neck, is hissing and constricted. The greater intensity of the hissing or constriction at the immediate region of the glottis, points to the seat of the constrictive disease.

Tubercular matter, grouped in masses even so small as mustard seeds, I have never seen in the larynx and trachea, and this product seems, when deposited, to affect very fine forms, scarcely visible to the naked eye, such as I have observed in the aorta and pulmonary artery. The distinct masses of tubercle which we find embedded in the mucous membrane of the bowels, both small and large, I have never seen imitated in the mucous membrane of the tubular apparatus leading to the lungs. The addition of important throat affections to pulmonary consumption adds seldom to the danger of the patient, but exposes him to grave inconvenience. Difficulty of swallowing tends to hasten dissolution.

The discovery of even advanced disease of the lung is in some cases impeded by the presence of strongly marked signs of disorder of the trachea, &c. The coarse and loud constrictive respiration sound through the upper portion of the air-tube apparatus, tends by descending into the lung structure to mask fine and single humid crackles in cavernules and in cavities. The cavernous voice is with some difficulty made out in cases marked by partial aphonia, and weak and whispered voice. The articulated voice, superficial and very near, so valuable as a sign of cavity is, of course, lost in cases of aphonia. I have seen several cavity cases in which, even after very diligent exploration, I have been left in doubt until a second examination has been made. The proportion of such cases is small, for careful listening will generally detect some amount of crackling, either cavernulous or cavernous,

and the voice over the diseased lung will generally show an unusual amount of distinctness and nearness. Besides in advanced softening and in cavity cases, the motion is reduced, and the percussion is either dull or of manifestly short duration. Coughing will sometimes give the requisite evidence. In cases of tubercular perforation of the pleura, the amphoric respiration and voice, and the clear percussion at first throughout the diseased side, and in the stage of effusion the clear percussion above, and the absolutely dull percussion below will almost always suffice to lend certainty to the judgment.

It is right, however, to mention that cases of cavity do sometimes present themselves in which the cavity has been altogether overlooked when such oversight is scarcely to be justified, and this has happened from the marked character of the throat complication causing the chest to be exempted from all exploration. Since very much attention has been given to the laryngoscope, and so much time expended upon its use, these overlookings seem to have become more than usually frequent. Perhaps this is in some measure to be explained by the fact that the laryngoscope has been largely adopted, and most usefully too, by some members of the profession, who had not previously seen much disease of the chest, or been familiar with the methods of exploration of that portion of the body. Such oversights are not only an injustice to the patient, but discredit the medical attendant, and are likely to prove injurious to him. To avoid all chance of such results it should be made a rule that, in cases of throat disease of any importance, either through the urgency or intractability of local symptoms, or suffering of the general health, the entire chest should be subjected to the tests of expansion, percussion, and auscultation, I would almost say of *differential* auscultation. With this chest examination such errors will not often occur, and should disease subsequently manifest itself, it will be felt that non-discovery did not rest upon culpable neglect.—*Medical Press and Circular, July* 1, 1868, *p.* 3.

29.—TREATMENT OF HÆMOPTYSIS BY ERGOT OF RYE.

By Dr. Horace Dobell, Senior Physician to the Royal Hospital for Diseases of the Chest, &c.

[Dr. Dobell considers that he has been very successful in the treatment of hæmoptysis arising from tuberculous disease of the lungs.]

I attribute the success of my practice in this respect mainly to the use of ergot of rye; because it is quite true, as already suggested, that, in nearly every consultation case of appalling hæmoptysis that I have seen, "everything has been done, and every remedy tried," with the one exception of ergot of rye; and the use of this remedy has generally turned the fate of the patient. It has always struck me as a singular fact, that general practitioners, who are so well acquainted with the effects of ergot in uterine hemorrhage—who use it more frequently than any other class of practitioners—with whom in fact it is almost a "pocket-companion"—never seem to think of using it in pulmonary hemorrhage. I find, from frequent inquiry of my medical friends, that this is explained by the prevalence of the idea that ergot only acts by inducing contractions of the muscular tissue of the uterus; its remarkable power of inducing contraction of the blood-vessels being lost sight of. This is so generally the case, that I never met with but one general practitioner in the London district (in the country it seems to be better known) who was at all aware of the power of ergot to control hæmoptysis. This exception was Dr. Betts, formerly of Highgate, now of Ventnor, who has as much confidence in the remedy as I have myself, and dates his confidence from the occurrence that, when a student at Guy's Hospital many years ago, suffering from profuse and intractable pulmonary hemorrhage, under the care of the late Dr. Addison, his case was on the point of being given up as hopeless, when the bleeding was suddenly brought to a standstill by a large dose of ergot, administered at his own request; the idea having

occurred to him, that, as it so often arrested uterine hemorrhage, it might also answer in hæmoptysis.

But I have said that, in the appalling cases to which I have referred, "everything else had been done, and every remedy tried," before I ordered ergot; and I desire to attach the greatest importance to this fact. Ergot is only competent to do one of the many things necessary to stop a severe pulmonary hemorrhage: viz., to contract the vessels. It is necessary to do much more than this.

1. The vital power must be supported by brandy, iced milk, and beef-tea, if indicated by the general symptoms.
2. The heart must be kept steady by digitalis.
3. Congestion must be relieved by saline purging.
4. Clotting of the blood must be promoted by styptics, and by the free admission of cold air.
5. The bleeding part must be kept at rest by position, by enforced silence, and by soothing the cough.

In spite, therefore, of the fashionable outcry against complicated prescriptions, I venture to give the following as the most efficacious, and, as it seems to me, the most rational, combination of remedies for a case of profuse tubercular pulmonary hemorrhage. It has served me many a good turn, and I hope it may do the same for my professional brethren.

℞. Ext. ergotæ liq. ʒij (to contract the vessels); tincturæ digitalis ʒij (to steady the heart); acidi gallici ʒj (to clot the blood); magn. sulphatis ʒvj (to relieve congestion); acidi sulphurici diluti ʒj (to assist the rest); infusi rosæ acidi ad ℥viij (to make a mixture). A sixth part every three hours till hemorrhage is arrested.

In any given case, either of the ingredients may be omitted, if the symptoms indicate that it is not required, or that it has already done its duty.—*British Med. Journal, June* 27, 1868, p. 631.

30.—ON THE INFLUENCE OF A DIGESTIVE HABIT IN THE PRODUCTION OF TUBERCULOSIS.

By Dr. David J. Brakenridge, of Edinburgh.

Notwithstanding the great advance that has of late years been made in our knowledge of tuberculosis, it is difficult to connect into one consistent whole the opinions entertained regarding the origin, nature, and treatment of this malady. The profession in this country is much indebted to Dr. J. Hughes Bennett for those views regarding the essential nature of the disease which he has so perseveringly and successfully urged upon its attention. They are much strengthened by the great success of that treatment which he has founded upon them, and many authorities are now amongst the number of those who believe that the immediate cause of tuberculosis is a deficiency in the chyle of those oily matters which, together with albumen, are essential to the formation of a true nutritive blastema. Most physicians, if they do not go so far, are at least of opinion that deficiency of fats is, in some manner or other, at the root of this condition, and that in the means of supplying that deficiency lies their hope of its successful treatment. In the great majority of cases there is a marked dislike of, and want of power to digest, fats, and every effort is made by tonics and other means to overcome this dislike; too often in vain, or with only partial success. Fortunately, in cod-liver oil and the pancreatic emulsion we have this important constituent of food in forms which are easily digested; so that a certain number of patients who have lost the power of ordinary fat-digestion, being able to digest these simple forms, are checked in their downward progress, and have, perhaps, the full power to elaborate the higher fats ultimately restored. But even with these powerful remedies in our hands the cases in which our oils disagree are not unfrequent, and the numbers still carried off annually by this scourge are very great.

In the following remarks I shall endeavour to show that by teaching our patients to flee the winter's cold and court a perpetual summer we are refusing to them the best tonic to fat-digestion which nature's generous pharmacopœia offers to our choice, and that, with our cod-liver oil and pancreatic emulsion in our hands, we ought rather to give them the benefit of a continued, but not too severe, winter temperature. Thus we might hope to restore the lost function and re-establish the normal and habitual digestion of oils. Several observing physicians mention, almost with surprise, that many of their patients in the earlier stages of the disease have seemed to derive benefit from a low temperature and to suffer during summer heat. It would be more surprising were the reverse true, for warmth, lessening the oxidation of, and consequent demand for, fats, hastens the establishment of that morbid refusal of them on the part of the digestive organs on which the disease depends; whereas, on the other hand, a cold temperature, by increasing the combustion of fat, gradually rouses the digestive organs to an effort to meet the extra demand. It is in this direction only that we can hope to correct this morbid digestive habit and restore the normal function.

Without entering into the whole subject of tuberculosis, I shall endeavour under the following heads to explain my views more particularly :—

1. The digestion and non-digestion of different kinds of food may and do become habitual.

2. The condition of body favouring the development of tuberculosis is a habit of non-digestion of fat.

3. The causes of this habit are such conditions as diminish the consumption of, and consequent demand for fat in the system—*e.g.*, warmth, impure air, want of exercise, &c.

4. In the treatment of this condition the indications are to break this habit, and to restore the lost power of digestion of oils.

5. This will be best done by supplying in increased force what we find to be the chief stimulants to the digestion of fat—*e.g.*, cold, pure air, exercise, &c.—and by avoiding all that would tend to confirm the bad habit.

6. Summer is therefore more to be dreaded than winter in the tubercular diathesis, and safety to be sought rather in choosing a cool bracing climate in the former season, than in the opposite and usual course.

1. *The digestion and non-digestion of different kinds of food may and do become habitual.*—Habit is, according to Dr. Johnson, "a power or ability of doing anything acquired by frequent doing the same thing," and as no acts are performed more regular than those of digestion, it does not seem unreasonable to extend the application of the law of habit to them. The nervous centres presiding over the process of digestion must, like other nervous centres, become educated by being repeatedly exercised in certain directions, and such powers as are the result of this process of education by frequent repetition we are justified in calling habits. But it is not to the nervous centres alone that we must look for an explanation of these. As the different constituents of our food are operated upon by the secretions of different organs, the functional activity of those which have been most used in digestion will be greatest. Hence, most gastric juice will be secreted by the hunting tribes who consume large quantities of flesh; most saliva by the inhabitants of warm countries, a great proportion of whose food is starch; and most bile and pancreatic juice by the fat-digesters of the Arctic regions. These considerations taken together explain what we here mean by habit. We shall find that these habits are governed by every variety of circumstance. In no two places, perhaps in no two individuals, are they exactly alike; but the most striking differences are to be met with in those who live under the most opposite conditions. Each nation has a dietary, more or less peculiarly its own, originating in the demands set up in the system by permanent surrounding agencies, and modified from period to period by the customs of the people and the alimentary resources of the country. The food of each country is preferred and most easily digested by its own inhabitants; on the other hand, disturbance of the digestive organs is usually the result of a change of country and diet. This holds true with regard to

comparatively slight as well as to great changes. For illustrations of great difference in diet let us take the two following:—We have the Esquimaux habitually consuming large quantities of fat, and showing a great dislike for starchy food—a typical digester of fats and non-digester of starch; and, on the other hand, we have the Hindoo living on rice and avoiding the rich hydrocarbons—an habitual non-digester of fats and digester of starch. In these, as in all other cases, we see that the desire for, and digestion of, different kinds of food are evidently regulated by surrounding agencies, operating through their influence on the chemical changes taking place in the body. But this is not all; for when a particular dietary has been called for and kept up for a considerable time, the functions of the digestive organs become so adapted to it, that, when the conditions giving rise to the necessity for it no longer exist, it continues to be desired and digested. Cases will occur to every one in which Esquimaux or Russians, &c., on going to a warmer climate, have continued to consume and digest unnecessarily large quantities of fatty substances, and have thus suffered greatly from the heat; and we have, on the other hand, the experience of our Arctic explorers, showing that many months have elapsed before such food as seal's liver and walrus blubber have become desirable, although they were from the first, as much as ever, demanded by the severity of the climate. The bilious attacks of Europeans on first visiting the tropics result from the still unbroken habit of fat-digestion; and the phthisis from which negroes and monkeys suffer on going to a colder climate, is attributable to their habitual non-digestion of fat. Most national digestive habits are probably the result of special conditions operating for generations, and consequently where the change is extreme, acclimatisation has been pronounced impossible, so difficult is it to break these habits. Individual habits, which are of shorter duration, may be more successfully combated. Hence the stubbornness of hereditary disease compared with the same when acquired.

2. *The condition of body favouring the development of tuberculosis is a habit of non-digestion of fat.*—By this I mean a comparative, not a complete, non-digestion. There is abundant evidence to show that in tuberculosis fat-digestion is defective. Almost all writers insist upon the repugnance felt in most cases for fat; and even where this dislike is not present and considerable quantities are taken, it is usually met with in the stools, showing that it is not digested. There is, therefore, every reason to believe that this diseased condition depends upon a deficiency of oil, and consequent relative excess of albumen in the nutritive fluid. Admitting this, the question still remains—How does this disproportion between these substances originate? To this no satisfactory answer has as yet been given. To say that it is due to acidity of the alimentary canal does not indicate where or how the departure from the normal condition begins. Acidity is only one of the events in the history of the disease, and may be traced to that general suboxidation which accompanies diminished vitality. Most probably it is to be met with in all cases of tuberculosis which get the length of a *post-mortem;* but there is no reason to believe that it is the essential beginning of the tendency to the disease. Preceding the deposit of tubercle there is a stage in which deficient energy is the most marked feature, and wherein no actual disease of any kind can be traced. But even here the deficient digestion of fat has become established, only enough being taken into the system to supply the waste of tissue. Such being the case, it only requires some little additional demand to be made upon this small stock of fat to cause actual disease, with deposit of tubercle to commence. Repeated or prolonged exposure to unusual cold is sufficient, by drawing up the limited supply of carbon, to disturb the balance between the fat and albumen, and thus cause mal-nutrition, with deposit of tubercle, particularly in those organs which are most active during the operation of the exciting cause.

The harmony which will be seen to exist between the recognised causes of tuberculosis and the conditions which favour the non-digestion of fats will most of all support this view.

3. *The causes of this habit are such conditions as diminish the consumption*

of, and consequent demand for fat in the system.—The appetite for, and digestion of, fat are originally regulated by the amount of its combustion in the body. Hence the causes of its habitual non-digestion will be those conditions which diminish that combustion. These may be pretty accurately ascertained by the amount of carbonic acid given off by the lungs under different circumstances.

(*a*) The temperature of the surrounding medium has a great effect on the amount of carbonic acid thus exhaled, heat diminishing and cold increasing the quantity. Hence cold climates and the winter season, by favoring the combustion of carbon, increase the desire for fat in the food. Warm climates and the summer season, on the other hand, are opposed to fat-digestion. Warmth applied from without in any other way will have the same effect; therefore warm clothing, confinement to warm rooms, the exclusive or excessive use of warm drinks, &c., will tend to establish this habit of deficient fat-digestion.

(*b*) Clothing has, as we have said, an effect similar to that of increased temperature, but differing in that it checks free perspiration. The non-conducting and close skins worn by the Esquimaux and other northern tribes must therefore greatly conserve the heat, and aid their increased carbon-combustion in resisting the influence of the excessive cold; whereas, on the other hand, the thinnest clothing must be very injurious in hot climates. Dr. Livingstone found by experiment that the temperature of the almost naked African was two degrees lower than his own.

(*c*) Other conditions being the same, increased density of the atmosphere diminishes, and lessened density increases, the activity of the chemical changes dependent on respiration; consequently in warm climates high altitudes are found to be beneficial to the consumptive, because they are more favourable to fat-digestion than lower-lying places.

(*d*) A moist state of the atmosphere promotes, and a dry state checks, the exhalation of carbonic acid; but the former checks, and the latter promotes perspiration. Thus, under the influence of moisture, heat is both formed and retained in the body to a greater extent than is required by the surrounding temperature. Hence a feverish state is induced which is antagonistic to fat-digestion; and as excretion from the skin is checked, and exhalation of carbonic acid is increased, extra work is thrown upon the lung, so that moisture may, by these combined actions, become an exciting cause of phthisis pulmonalis where the predisposing habit already exists. Dry hot air is, therefore, more easily borne than moist, and the advantages of a dry climate such as Egypt may depend upon the diminished heat of body from lessened oxidation and increased perspiration.

(*e*) Sleep and waking have a most important influence on oxidation. Professor Pettenkofer has quite lately shown most conclusively "that large quantities of carbonic acid are produced during the day in waking, whether we work or not, and that the absorption of oxygen during the day is comparatively trifling; while at night, during sleep, large quantities of oxygen are absorbed and stored up in the system, in order to enable us to compensate the previous extra waste of oxygen, and to be again prepared on the day following for the requirements of waking life." (See Medical Times and Gazette, 1866 and 1867.) According to his experiments, oxidation would appear to be a much less simple process than hitherto supposed, and the oxygen is probably occupied in various stages of oxidation within the system before the ultimate products of combustion—viz., carbonic acid and water—are formed. These experiments accord perfectly with, and therefore derive support from those previously made on animals during hybernation. Certainly the above conclusions throw great light upon the habitual non-digestion of fat as a cause of phthisis, for in this disease no conditions are more constant in their operation than those to which we are subjected while sleeping. However varied our occupations and surroundings may be during the day, night after night we are under almost the same influences. The importance of close sleeping apartments in the production of phthisis has long been recognized; and, looked at in the light of these investigations, it cannot well be over-estimated. Amongst

the poor of our large towns this cause must operate most powerfully; for, in addition to the numbers usually crowded into each room and closet, in winter every means is taken, on account of the scarcity of fuel, to prevent the free access of air. In the better classes closely curtained beds, and heated bedrooms during the cold season, have a somewhat similar effect, and the little inhabitants of the nursery, who, proportionately to weight, should absorb very much more oxygen than adults, are often crowded into an ordinary sleeping apartment, with the addition of nurses, and not unfrequently one room serves the double purpose of night and day nursery. Here, therefore, in both classes we have a constant source of deficiency of oxygen in the blood, and consequently of lessened demand for fat in the food. These experiments of Pettenkofer throw much light upon the large amount of carbonic acid given off, according to Dr. Edward Smith, during the early hours of the day, and the diminishing exhalation in the evening.

(*f*) Impure air was believed by Baudelocque to be the true and probably the sole cause of phthisis; and experiment has shown that relative purity or impurity of the air affects the amount of carbonic acid given off by the lungs considerably. Thus, if any amount of carbonic acid was present in the air, the quantity exhaled was lessened. When 300 cubic inches of air were repeatedly breathed for three minutes, only 9·5 per cent., or 28·5 cubic inches in all were given off, although when fresh air was breathed at every inspiration, the amount exhaled was 32 cubic inches per minute. In badly ventilated rooms, therefore, a deficiency of oxygen operates at night, and an excess of carbonic acid during the day, in the establishment of a lessened demand for fats.

(*g*) Muscular exertion increases the quantity of carbonic acid exhaled, both during its continuance and for some time afterwards. But exercise is principally a cause of the digestion of albumen; for great muscular exertion causes the albuminous compounds to be broken up, force and heat being the result. Thus, to a certain extent, the necessity for highly carbonaceous substances is diminished. Hence we find that in training fat is avoided. When training is suddenly left off, the habitual non-digestion of fat being thus more or less established, and the amount of albumen decomposed in the system being insufficient to keep up the heat of the body, the balance is apt to be disturbed, and tubercle deposited. Hence many athletes die of phthisis.

(*h*) The quality and quantity of the food supplied must directly influence the exhalation of carbonic acid and the habits of digestion. The scarcity and high price of good milk, butter, eggs, and fat butchers' meat in large towns has much to do with the development of the habitual non-digestion of fats in early life, and the much greater tendency to phthisis in town than in rural populations must owe its origin to this cause amongst others, especially when taken in connexion with insufficient clothing.

(*i*) The depressing passions and great mental exertion have both the effect of diminishing the amount of carbonic acid exhaled, probably by lessening the number of pulsations and respirations.

We have thus briefly reviewed the conditions which chiefly influence the oxidation of carbon in the body, and which either lessen or increase the demand for fatty substances in the food. It must strike every one that those which lessen the exhalation of carbonic acid are exactly those which, when operating for a length of time, are recognized as the chief causes of tuberculosis. But, as fat digestion is admitted to be dependent upon the combustion of carbon in the body, it may naturally be asked, is not deficient oxidation the first link in the chain of causation? I think not, for it seems probable that, to the extent that there is fat in the fluids of the body to be oxidised, the system will respond to the demands made upon it by external conditions, and that in this readiness to be influenced by those agencies, which promote the oxidation of carbon, we have the explanation of the mode in which the exciting causes of the disease act. Suppose, for example, that, in a certain man, through the long continued influence of heat, the power to digest fat has become lessened; let this man now be at once exposed to the influence of continued cold, and no reserve of fat being habitually supplied

for the purpose of keeping up the heat of the body under such a temperature, that which is intended for tissue-formation is drawn upon, and deficient tissue renewal is the result. That the faulty action is to be looked for in the digestive organs may be further inferred from the fact that, when we get cod-liver oil to pass into the system, oxidation seems to proceed perfectly. Admitting, then, that the digestive organs are at fault, I think that the explanation here given is more satisfactory than any other.

4. *In the treatment of this condition the indications are to break this habit and restore the lost power of digestion of oils.*—We have seen that there is every reason to believe that the condition which really favours the development of tubercle is a habit of digestion, and we have examined one by one the various external influences to the continued operation of which its formation must be attributed. In seeking to effect a cure in the early and remediable stages of the disorder, it will therefore be our endeavour to correct this habit.

5. *This is to be best done by supplying in increased force what we find to be the chief stimulants to the digestion of fat.*—Having already considered in detail what these are, we shall avoid doing so again. Our success in the treatment will depend on our bringing into operation in each case a suitable combination of these conditions. In all cases the food is the chief thing to be attended to. The importance of this has long been recognized, and the matter of late years successfully studied. The result is that we are in possession of the two very easily digested substances, cod-liver oil and the pancreatic emulsion. These will pass into the system under many unfavourable circumstances, but, for reasons stated at the outset, they are not nearly so useful as they might be were they given under such circumstances as would operate powerfully in causing a demand for them in the system.

It is the fact that we possess fatty substances which will so readily pass into the blood, which makes us hope most from that treatment which we propose. If we had not the assistance of these first steps in fatty food, we might have some hesitation in urging these doctrines so strongly, as there might be some risk during the period which would elapse before ordinary fats could be digested. But in favour of cod-liver oil there is much to be said. When we have the first indications of tuberculosis presented to us, a certain amount of tubercular exudation has usually already taken place, and in our endeavour to cure the disease we have two indications to fulfil. First, in order to restore weakened tissue and prevent its further destruction, a properly constituted molecular fluid must be supplied to the blood. This will not, however, of itself suffice to remove previous exudation. Now we know, from their effects on enlarged scrofulous glands, that bromine and iodine both promote absorption of the exudation to a certain extent, even when given in our clumsy formulæ. The second indication, then, being the removal of this exudation, we have in cod-liver oil, ready-made by a living animal organism, a combination of these medicinal substances with an easily digested oil most suitable for application to a living structure. Thus, in administering cod-liver oil we with one substance fulfil both indications. Moreover, by having our medicines organically united with the reparative fluid, we insure their reaching and being brought into the most intimate relationship with the weakened tissues in the process of their renewal. Their operation being thus inseparably connected with the vital changes in the diseased parts, we can readily understand how small doses of these agents will, in this way, act much more powerfully than much larger quantities of the same substances administered in forms which have no affinity to the diseased structures. I should not class the pancreatic emulsion along with cod-liver oil, as, although both are easily digested, they are opposed to each other in their effects, the former being merely palliative, while the latter is truly curative. The emulsion, by supplying along with the fat the secretion which should digest it, removes the natural stimulus to the restoration of that secretion. Administered with the cod oil, and gradually giving place to the latter, its use may be attended with benefit at the commencement of that stimulating treatment which I recommend, by supplying the body from the first with a sufficiency of carbon, and thus preventing any risk that

might attend the change from a warmer to a colder climate with increased oxidation.

To remedy defective nutrition by getting oil into the system, and to restore to the digestive organs the power of doing so habitually, being our aim, all other questions will be measured by their bearing upon this. With a view to this end the question of climate is of paramount interest. The climate of any locality is, for our present purpose, a combination in its atmosphere of certain conditions influencing the oxidation of carbon in the body. A favourable combination is to be met with only in certain places, and cannot be created at will elsewhere; whereas all other conditions having a similar influence may be supplemented anywhere. Thus a particular temperature, moisture, and density of the atmosphere cannot properly be commanded in any locality at will; but we can regulate our food, clothing, exercise, and ventilation as we please, wherever we are.

Now so little care has been taken in discriminating between the different stages of the disease in all the statistics and observations which we have regarding the influence of climate in tuberculosis, that they are more contradictory and confusing than useful. The conclusions to which I have come are, that in the earlier stages of the disease, especially that of predisposition to it, those conditions which favour the oxidation of carbon in the body will be most beneficial and truly curative; whereas, on the other hand, in advanced cases in which cure cannot be expected, and we can merely hope to prolong life by palliation, benefit will be derived from the moderate influence of those conditions which check the consumption of carbon. In the former case a cool bracing dry climate should be sought, and the use of large well-ventilated rooms at night, with plenty of exercise in the open air by day, only a sufficient amount of clothing to prevent chill (that next to the skin being woollen), baths gradually reduced in temperature, and a graduated scale of oleaginous food, should be assiduously yet cautiously persevered in. In most countries elevated situations, with diminished density of the atmosphere, will be preferable. In cases of hereditary transmission, perfect cure may be impossible in one generation, although great benefit will be derived from perseverance in the course advised. In cases of advanced disease we may choose a milder climate, warmer clothing, with perhaps a more humid atmosphere (?), and the pancreatic emulsion will pass more readily into the system than other forms of oil. Such palliative measures will also be advantageous in acute attacks at the outset of the disease for the purpose of lessening functional activity until inflammatory action has ceased, when we may cautiously commence the more bracing and truly curative treatment.

6. *And now, in conclusion, summer is more to be dreaded than winter in the tubercular diathesis, and safety to be sought rather in choosing a cool bracing climate in the former season than in the opposite and usual course.*—It may be urged against this proposition that most attacks of phthisis are found to take place in winter. I grant this; but I believe that the predisposition to these attacks is chiefly established during summer. The taste for fats which each winter more or less developes, continuing on into summer, is the real predisposing cause of those bilious attacks which are so common in the latter season, the unnecessary accumulation of rich materials in the blood being their cause. In like manner the deficient digestion of, and dislike to, fats, which are the result of summer heat, continuing on into winter, are the cause of those acute attacks of phthisis which are so common then, the greater consumption with diminished supply of fat causing a disturbance in the relative proportion of the oil to the albumen in the nutritive fluid. In many cases, as we have already hinted, the salutary and counterbalancing influence of winter has for years been annulled by confinement to close apartments, too warm clothing, and insufficient exercise during the cold weather, and thus the morbid habit has become developed. For such reasons, seeing that the evil effects of too long-continued imitation of a summer temperature, with many other aggravations, have much to do with the origin of the malady we are dealing with, I think it highly advisable that this mischief should be checked by avoiding any exposure to those conditions which have given rise

to it, and that we should endeavour by a continued exposure to a bracing degree of cold, with the other means already mentioned, perseveringly to conquer inch by inch the ground that has been lost until the habit of fat-digestion has been perfectly established and health restored. *Med. Times and Gazette, June* 13 *and* 20, 1868, *pp.* 633, 658.

31.—SOME POINTS IN THE PATHOLOGY AND TREATMENT OF ACUTE CAPILLARY BRONCHITIS.

By Dr. J. K. Spender, Bath.

Acute capillary bronchitis has had several synonymes. It is the *peripneumonia notha* of the older authors: the *acute suffocative catarrh* of Laennec; the *asthenic bronchitis* of Dr. Copland. The nomenclature which I use now is that adopted by the most recent writers; it seems to convey accurately what is meant, to wit, an inflammation of the terminal bronchial tubes—tubes nearest to the air-cells in size and function—followed by an exudation which more or less obstructs them.

I have been surprised by the comparatively little prominence given to this appalling disorder in the best professional text-books. Either it is scarcely noticed at all, or it is discussed as a variety of common acute bronchitis. The disease is certainly not very common, but it is by no means rare; and I now venture to plead the substantive entity of acute capillary bronchitis, and its claims to a distinct nosological position. Dr. Addison employed the term "capillary bronchitis" to signify the irritative action set up in the lung by tubercle; but it is obviously unwise to apply the same term to two diseases so etiologically different.

An adult person suffering from general capillary bronchitis of the acutest kind presents very well-marked symptoms; and, as might be expected, those that are most urgent belong to the respiratory system. (*a*) He breathes with extreme quickness; the pulse and breath ratio deviates from the norm sometimes so much as to be 2 to 1; ratios of 2½ to 1, and 3 to 1, belong to the ordinary characteristics of the disease. (*b*) He coughs very often, and expectorates a light foamy sputum. (*c*) His skin has a dusky-purple tint, the intensity of which is commensurate with the blood-stasis in the lungs.

(*a*) Concerning the first of these symptoms;—the *rapidity of the respiratory act* is governed by the law so clearly laid down by Dr. Hyde Salter, that the urgency of dyspnœa is in direct proportion to the soundness of the lung-substance, free access of air being cut off to the functioning portion of the lung by obstruction of the air passages. And this formula applies with precision to the case of acute capillary bronchitis; for, according to the conditions of the problem, the physiological area of the lung is everywhere free and capable of fulfilling its duty. The dyspnœa is severe enough even in partial capillary bronchitis; but when the disease is more or less universal, we have every condition present for producing a difficulty of the most extreme degree.

(*b*) Concerning the second point specified—the *frothy sputa* with which the finer air-tubes are choked; I remark, firstly, that this exudation does not afford so complete an obstacle to the inspiratory and expiratory currents of air as spasm of the air-tubes. Narrowing of these tubes by spasm makes the breath-currents narrow, and therefore slow. The muscular element is prolonged to the terminal bronchia; but notwithstanding this, the respiratory movements go on at a tremendous pace, and produce the well-known auscultatory phenomenon of coarse bubbling crepitation—like "squeezing a sponge half saturated with water." Next, I have to indicate the probable double origin of the sputum. It is, of course, partly a true exudation from an inflamed surface, and in the ultimate stage it contains pus-cells. But there is a transudation of serum into the bronchial tubes, arising, as Dr. G. Johnson has sagaciously pointed out, from engorgement of the bronchial veins; this engorgement being a sign and a consequence of a blockade in the pulmonary

circulation. And there must be a very great disturbance of the pulmonary circulation when there is such terrible apnœa. If the pulmonary œdema, which so often occurs in the course of uræmia, is a true dropsy of the connective tissue of the lung—of the *inter*-tubular structure, in fact—then the transudation of serum from congestion of the bronchial veins is an *intra*-tubular dropsy, a dropsy of the true "parenchymatous" sort; and often not less fatal.

(*c*) *The dusky hue of the skin* is sometimes loosely called cyanotic. I submit, however, that the term "cyanosis" ought to be restricted to regurgitation of imperfectly aerated blood from heart-distress, and not to mere stasis caused by difficulty in the lung. Not quite two years ago, I had under my care a case of typical cyanosis in the person of an otherwise healthy young woman, the daughter of a farmer near Bristol. The whole stress of the matter seemed to arise from a slight narrowing of the pulmonary artery (without lesion of its valves), which a dilated and weakened right heart had not power to overcome. The entire face looked as if smeared with black currant juice of the deepest dye, the lips being fearfully crimson. The dyspnœa was most intense. Now this was a true cyanosis; and the absence of any irretrievable cardiac malformation was proved by the perfect success of a ferruginous treatment, which imparted tone to the right heart, and restored the natural tint to the complexion in a few months. Compare this with the mere dull purple colour developed by capillary bronchitis and other analogous affections of the lungs, and the difference is sufficiently conspicuous to be diagnostic.

The compound condition known as "collapse" is very marked in acute capillary bronchitis. The skin is cold and sweating; the bowels are confined; the urine is turbid and very scanty. The likeness of this condition to what happens in cholera, and during a paroxysm of asthma, is evident enough.

A few words on *diagnosis*. It might be summarily asked—Is there any disease which can be possibly confounded with acute capillary bronchitis? Listen to this short story. One day last winter, there was brought to me at the Eastern Dispensary, Bath, a young girl who was wheezing, panting, and purple. Before asking the mother (who accompanied her) a single question, I said to myself—Is this child suffering from capillary bronchitis, acute tubercle, or mitral regurgitation of heart with secondary lung-disease? I ordered her home, and examined her in bed the same evening. A glance at the thermometer decided the matter; the temperature was above 103 deg., and the child was dead within three days. But I was almost amazed at the similitude of many of her objective signs to those of capillary bronchitis; the main point of unlikeness being the very scanty sputa (mixed with a little blood), and the decided heat of skin. And the history of the case was very distinct in its indications of tuberculosis.

A person who has suffered severely from capillary bronchitis is often long in recovering the usual bright florid hue of skin. You may see him all the next summer carrying about a sure legend of the peril he has undergone; he looks metallic and dull, and is chary of any swift exertion. He has been smartly hit in a vital point, and he dreads what the next winter may bring forth. Influenza is perhaps one of the most serious epidemic maladies which he has to fear. There is usually some emaciation. Capillary bronchitis in children is always a most dangerous disease.

Treatment.—We start from the postulate, that capillary bronchitis is often amenable to skilful and decisive treatment, if it be begun early enough. The pathological picture which has been drawn is rather dark, but by no means discouraging. Certain land marks stand boldly out, which we may follow without hesitation.

On Sunday morning, April 14, 1867, I was asked to see a labouring man, a patient of the Eastern Dispensary, Bath, who was in the collapsed stage of this disease. Every feature was well marked, and he seemed in great danger. My internal remedies were—a table-spoonful of brandy every two hours; five grains of sesquicarbonate of ammonia every two hours, alternately

with the brandy; and a small quantity of fresh cold milk whenever it could be taken. My external remedies were—a warm atmosphere rendered moist by steam; and a hot linseed meal poultice over the whole of the back of the chest. In the evening he was better; the skin was warm, the dyspnœa less urgent, and the urine was less scanty. The same means were continued with the same success. He improved day by day; he gradually took strong broths and less and less alcohol, and within a week was rapidly convalescent.

In some excellent clinical remarks on capillary bronchitis written some years ago by my friend Dr. Hyde Salter, he objected to using alcohol in this disease, on the ground of its giving the lung more eliminatory work to do during an emergency when physiologically it ought to be kept quiet. My apology on the other side must rest on the facts so clearly substantiated by Drs. Anstie and Inman, that (*a*) alcohol affords a positive dynamic support to the nervous system; and (*b*) it is a temporary food which sustains vital function until more complete compounds can be appropriated. And all *à priori* objections vanish before the favourable test furnished by actual experience.

Concerning sesquicarbonate of ammonia, I am amused by the divergent opinions which prevail among my medical friends about this drug. I know two physicians, one of whom literally prescribes it for almost everything; and the other as unqualifiedly declares that he has no faith in it for any curative purpose whatever. Adopting a kind of middle view, I incline to the doctrine that this salt is a valuable therapeutic auxiliary to other measures when we have to contend with certain forms of bronchial distress. I am sure of its capability to do good service in the proper asthenic bronchitis of old people. I claim for it no higher virtue, because I know our proneness to call any drug a *specific* which we know particularly well how to work with.

I would beg special attention to the absolute mortality of the smallest quantity of opium, and to the still more destructive effects of morphia.

If a patient be teased by residual catarrhal sputa, a short mercurial course will clear it away; and after that (or even at the same time) an iron tonic will help to restore the general health.

Great care must be taken at all seasons of the year that the skin is properly protected.

To recapitulate: I would specify the following points as deserving notice in the clinical history and management of acute capillary bronchitis:—

1. The extraordinary pulse and breath-ratio, and the intense dyspnœa.
2. The pathological origin and character of the sputum.
3. The quasi-cyanosis of the skin, together with the so-called "collapse."
4. The occasional indistinctness of the diagnosis from acute tubercle.
5. The necessity of a supporting and alcoholic treatment.—*Brit. Medical Journal, Sept.* 19, 1868, *p.* 304.

32.—CASE OF PLASTIC BRONCHITIS, WITH "QUASI" DIPHTHERITIC EXUDATION.

By Dr. Douglas, one of the Vice-Presidents of the Edinburgh Medico-Chirurgical Society.

[The patient, whose case forms the subject of the following article, was a letter-carrier, aged 31, a spare delicate-looking man. He complained of acute pain in the left mammary region, catching his breath, and aggravated by the least motion. Yet, with all this, the most careful examination failed to detect any physical sign of pulmonary disease.]

On the following day, his distress was in no degree abated. Pain was intense; he was flushed, with suffused eyes. Pulse 104. Tongue coated; bowels torpid; breathing little distressed. He had slept none, and had perspired profusely. On examination of the chest, the left dorsum was found dull on percussion, with tubular breathing and other signs of consolidated lung; but neither crepitation nor pulmonary rattle existed.

[The administration of half-grain doses of tartar emetic was not productive of relief. On the fifth day, dull percussion, with tubular breathing existed, and there was a gray pellicle in the throat and mouth.]

The antimony was replaced by solution of nitre, and he had a drachm of chlorine-water every three hours. Speedy abatement of his distress followed, though the pulse increased in frequency to 120. Pain with breathing ceased, the gray pellicle commenced to separate from the throat and mouth, and was not reproduced; at the same time, a rare subcrepitating rattle was developed in the contiguous confines of the left subclavian, mammary, and axillary regions.

On the eighth day of his attack, he presented a marked improvement in appearance; the respirations had fallen to 27: pulse to 112. Perspiration, which had been considerable, nearly ceased. Progressive separation of the pellicular exudation was going on; and, for the first time, he expectorated, with no great difficulty, dense globular masses of a pearly-like mucus which sank in water. These dense masses attracted my attention by their curious lobulated configuration, and the lobules or nodules on the surface unfolded themselves when the mass was shaken in water, and appeared to consist of rolled-up casts of the bronchial tubes. Examined with the microscope, the casts presented the cells and fibrous structure of epithelial *mucus* and plastic *lymph*. The subcrepitating mucous sounds already mentioned could now be traced extensively in the left dorsum.

From this date improvement was but little interrupted, though it was slow. On the eleventh day the pulse was 72; and the pellicular exudation had disappeared from the throat, leaving the subjacent mucous membrane of an intense red colour. Dull percussion persisted in both dorsal regions, with the sounds of respiration masked; and in the right there existed the sound of friction.

He was unable to be out of bed till the 12th of October (the thirtieth day of his illness), and as late as the 21st of October he was liable to acute pleuritic attacks, with catching pain and febrile heat of the skin. To the end of October augmented thrill of the voice and soft submucous rattle existed over the upper parts of both lungs, while in both lower dorsal regions there was dulness of percussion, faintness of the respiratory murmur, and diminished thrill of voice.

He resumed his official duty on the 13th of December, and he has not had occasion for medical aid since that date. I examined his chest a few days ago, and found the sounds of percussion and respiration in the normal condition. His general health is good, and he is an active and efficient officer. He complained, however, that the state of his throat interfered with his comfort in speaking and singing; but this has ceased since the removal of the uvula, which was excessively relaxed and tumid.

Plastic or pseudo-membranous bronchitis occurs as an acute and idiopathic disease in only a small proportion of cases. I have not met with it except in the case I have described. It is more usually observed as a chronic and remitting or recurrent malady, and often complicating other and organic lesions.

The complete recovery made by this patient entitles the case to our attention; but additional and great practical interest attaches to the case, considering the pneumonic character of its early stage, and the "quasi" diphtheritic state of the throat which it subsequently presented.

In the remarks I offer I shall not attempt anything like a full analysis of the case; it will be better to note shortly some of the particulars which gave it peculiarity. In commenting upon a solitary case, there is no call to discuss the history or pathology of muco-plastic exudations; and, indeed, in following the history of a case to a termination so favourable, the diagnosis and therapeutics of the disease more naturally present themselves for our consideration.

It is to be noted, that I visited the patient on the first day he was confined to the house, and, though he had shivered on the second day previously, he had performed his duty as a letter-carrier on the preceding day. It will be observed, that on my first visit my attention was fixed upon his intense suffering in the left breast (impeding movement) and upon the general fever. It seemed more than probable that this was not the suffering of a mere pleurodynia, and I was the more readily led to infer that acute pneumonia was

being developed, having repeatedly met with cases of pneumonia especially involving the upper lobes of the lungs, in which distressing pleurodynia existed. I hesitated, however, in this opinion, considering not only the absence of physical signs—no exaggerated respiration, crepitation, nor any pulmonary rattle—but also considering the general state of the patient, with a look of depression so marked, and the severity of his local pain. The treatment was accordingly in some measure expectant and soothing. But on the following day the signs of consolidation in the lung of the suffering side confirmed me in the opinion and led to a more active contra-stimulant treatment.

It must be noted, however, that the consolidation arose not in the situation I anticipated, but low down in the part usually so affected in cases of pneumonia, and that it was followed almost immediately by a similar consolidation of the opposite lung. Viewing the facts of the case retrospectively, I believe that the seat and occurrence of these consolidations were determined by a broncho-pneumonia originating in communicating ramifications of the tubes, as well as independently in the cells or parenchyma of disconnected lobes of the lungs. From the hurry of respiration (42) which now occurred, it is reasonable to suppose that both lungs were involved to an extent greater than was indicated by the external physical signs. I was now shaken in the opinion that the case was one of pneumonia; and as he had taken large and repeated doses of tartar emetic with absolute tolerance, I examined his throat lest there might be any sign of local irritation from the antimony, and, to my great surprise, I found it in the state described in the narrative I have read.

In these circumstances, it was a sufficiently natural inference that the case had acquired, if it had not possessed from the outset, a diphtheritic constitution, and that the pulmonary lesion participated in this. This view, however, could not be maintained, on satisfactory grounds, though the patient's general condition in a measure suggested it, and the further changes in the pulmonic symptoms appear to justify the view that the case was one of bronchitis with muco-plastic membranous exudation, the parenchyma of the lungs and the pleura being involved in the inflammatory state.

It was not until the eighth day of his illness that the peculiar expectoration set in, and on the preceding day we observe that the pellicular exudation began to separate from the throat, concurrently with submucous sounds in the chest indicative of a change in the character of the exudation there. The concurrence of these changes and the abatement of the general symptoms is evidence of the close relation of the affection of the lungs and that of the throat; but to prove or explain their mutual relations it is not needful to suppose the existence of a diphtheritic constitution. On any theory of the case, it is remarkable that the larynx and trachea should have escaped the local disease; but I shall not detain you by speculative explanations of these points.

I have not met with any other case in which the expectoration presented the peculiar dense masses which, by shaking in water, were shown to contain so fragile muco-plastic casts of bronchial tubes, larger than the smallest subdivisions. The only description of a similar expectoration I have seen is by Dr. Hyde Salter, in a case communicated by him to the Pathological Society of London, in May, 1860. Dr. Salter's case was chronic, and the bronchitis appeared to be limited in extent. I incline to think, however, that such a state of expectoration is the result of recent and more or less acute action.

In many of the cases described by authors, blood was observed mingled with the expectoration. The absence of all appearance of blood in the case of my patient is not by any means singular, though tinting of the expectoration might as a rule be anticipated, especially in cases so acute. In the present case, the distinctive peculiarities of the expectoration were the delay in its appearance, and its *general* as well as its *minute* physical characters.

I have previously said that the condition of the patient suggested that his illness was diphtheritic, though I could not maintain that opinion on grounds satisfactory to my own mind, and I am now less than ever inclined to take that view of the case.

I shall not detain you by discussing the question, which would open up considerations beyond the limits of a commentary on a solitary case.

It might indeed be argued plausibly enough that the semi-typhoid state of the patient, with a depressed circulation and protracted sweating, the disconnected pellicular exudation on the throat and bronchial surfaces—the larynx and trachea remaining intact—the absence of cough, the retarded convalescence, the prevalence of diphtheria for some time previously, of which two of his children had died, and other conditions, indicated a constitutional disease, probably diphtheritic. But though on either supposition it might be difficult to explain some of these symptoms, none of them is inconsistent with the view that the case was one of muco-plastic bronchitis,—a condition which probably has a close affinity to acute pneumonia.

The treatment by alkaline and antiseptic remedies adopted at this stage of the attack, when the albuminous and plastic nature of the exudations became apparent, was I believe, peculiarly appropriate, and the rapid improvement in the symptoms during the succeeding days was confirmatory of the good effect of these remedies. Some of the practical conclusions suggested by the case seem to be :—

1. That there may be acute pain independent of pleuritis ; and,—
2. The concurrence of isolated and disconnected centres of pulmonary inflammation.
3. The absence of cough, except with,—
4. The characteristic muco-plastic expectoration.
5. An ataxic condition of the general symptoms.
6. Recurrent pleuritic attacks.
7. Tardy convalescence.
8. That the appropriate remedies are the alkaline salts, with antiseptics and stimulants—a mode of treatment often serviceable in cases of acute pneumonia, as well as in those of diphtheria.—*Edinburgh Medical Journal, July* 1868, *p.* 2.

33.—CANNABIS INDICUS IN CATARRHUS SENILIS.

By Dr. J. Waring-Curran, Dublin.

[In those cases of senile catarrh where the mucus accumulates in the bronchiæ, where the constant dry barking cough affords no relief to the pent-up mucus, and only harasses and distresses the patient, there is no better remedy than cannabis indicus.]

Case 1.—R. S., aged 57 years, of delicate appearance, with narrow shoulders, and contracted chest, has suffered from repeated attacks of chronic bronchitis, of which she states the present is the worst attack of all. Has been ill four days. The usual domestic nostrum, paregoric, linseed tea, and Spanish juice, *et hoc genus omne*, have lost their virtue, and failed to afford relief.

The skin over the anterior part of the chest is well blistered, owing to the repeated applications of mustard poultices. The secretions are normal, and the bowels have received attention. The patient has been unable to lie on the back since the commencement of her illness, depending on the constant and distressing nature of the dyspnœa.

On stethoscopic examination all sorts of sounds are audible, on both inspiration and expiration; sibilant rales are most distinct at the base and ronchi at the superior part of thorax. There is a constant, dry, protracted cough, which "cannot get round," to use her own words, "the obstruction."

The pulse is 120; the skin moist; the lips livid, and the face blanched, and indicative of suffering.

℞. Tr. cannabis indicis ℥ii.; pulv. tragacanth co. ʒi.; ether chloric ʒiss.; aquæ anisi ad ℥ vj. Fiat mist., et capiat ℥ i. 2ndis horis.

The following day, I learned before three doses of the mixture was taken, the cough became "loose, and the expectoration easy and most profuse."

She expectorated freely for several days, and rapidly recruited on a liberal regimen, and bark and ammonia mixture.

Case 2.—A. B., aged 69, subject to frequent bronchitic attacks, has been ill for a week, expectorates but little, and with considerable difficulty; is very feeble, and has been taking ammonia and senega with little alleviation, ordered the tr. cannabis in mixture, which produced the desired effect of liberating the mucus and affording relief to the cough. Speedy recovery.

Case 3.—R. P., 70 years of age, has been previously under treatment for catarrh, now presents all the unequivocal symptoms of chronic catarrh. Has recovered sooner under the effects of cannabis than from any of her previous attacks; has grown fond of her medicine, which produces free expectoration after the administration of each dose.

Case 4.—J. P., aged 60, speedily and satisfactorily recovered from a severe and protracted attack of catarrhus senilis after the exhibition of cannabis indicis.—*Medical Press and Circular, Sept.* 9, 1868, *p.* 222.

34.—HOARSENESS AND LOSS OF VOICE IN RELATION TO NERVO MUSCULAR AFFECTIONS OF THE LARYNX.

By Dr. Morrell Mackenzie.

[Dr. Mackenzie divides paralysis of the vocal cords according to the muscles or sets of muscles implicated. Debility and hysteria are undoubtedly the most frequent causes of this disorder, which is common in the second and third stage of phthisis, without structural change. Most commonly, however, it results from catarrhal congestion. The hoarseness and cough disappear and the voice is entirely lost. Inhalations and local applications often fail in the cure, but, the author says,]

There is one remedy which is almost always successful. This is the direct application of electricity to the vocal cords. The external application seldom restores the voice when it has been lost for any length of time, but it may often be advantageously employed in keeping up the effect produced by the more direct current. In other words, when the voice has been restored by the introduction of a pole into the larynx, the effect can often be kept up by the occasional application of the external current.

In using the direct current, one pole is introduced within the glottis, and the other pole applied externally. In this way the voice is often immediately restored. Some few years ago, I invented a little instrument called my "laryngeal electrode," by means of which the electric current can be applied with great facility to the interior of the larynx. It consists of two parts; viz., the necklet, which the patient wears, and to which one chain of the battery is attached, and the laryngeal electrode itself which is also connected with a battery. The latter is so constructed that the electric current does not pass beyond a certain point, until the pole is seen, in the laryngeal mirror, to be upon the vocal cords; when the operator touches a little spring in the handle, and the current immediately passes through the laryngeal muscles. The necklet should be worn rather low, so that it covers the sides of the cricoid cartilage, and the space between it and the thyroid. In this way the lateral adductors of the cords (crico-arytænoidei laterales) can be most easily reached, and the arytænoideus proprius, or central adductor, may be electrified, by placing the pole on the posterior surface of the arytænoid cartilages.

I generally keep the pole in the larynx for three or four seconds each time it is introduced, and pass a succession of short rapid shocks through the larynx; and at each sitting I apply the pole to the interior of the larynx three or four times. The source of the electricity is not a matter of any importance. I have found equally good effects follow, whether a battery or a magneto-electric machine is employed.

Out of more than two hundred cases that I have treated in this way, I have only met with four cases in which this treatment was not successful. In

three of these no effect was produced, and in the fourth such violent hysterical attacks came on whenever the treatment was attempted, that it was obliged to be discontinued.

So many cases of this sort, in which the direct application of electricity succeeded after the failure of every other kind of treatment, have already been published, that I do not think it necessary to give more than three or four illustrations. I shall, therefore, select four of the most recent cases, and relate them very briefly; before I do so, however, I may observe that the electricity possibly, and perhaps probably, does not act *directly* on the muscles paralysed, but *indirectly*, through reflex action, by causing a kind of spasm of the glottis. When one pole is placed on the vocal cords, and the other on the neck externally, between the thyroid and cricoid cartilages, the electric current must doubtless pass through the adductors; but it is more probable that the contraction of these muscles is of a reflex character, brought about by the electric shock to the glottis.—*Clinical Lectures and Reports of London Hospital*, 1867–8, *p.* 85.

DISEASES OF THE ORGANS OF DIGESTION.

35.—THE THREE VARIETIES OF DYSPEPSIA.

By Dr. Henry Browne, M. A., Manchester.

[The following useful extract is from a report of the practice at the Manchester Royal Infirmary. Speaking of Dr. Browne, the Editor of the Medical Times and Gazette says:]

He recognises three principal kinds of dyspepsia, which he calls respectively sulphuretted hydrogen dyspepsia, or that accompanied with "rotten egg" eructations; carbonic acid dyspepsia, or that evidenced by tasteless eructations; and butyric acid dyspepsia, in which the eructations are sour or acrid. To a patient suffering from the first-named of these he recommends abstinence from meat and eggs, and prescribes farinaceous diet along with a mixture containing strong hydrochloric acid and chlorate of potash, filled up with a vegetable bitter. In the case of patients afflicted with carbonic acid dyspepsia he orders a lean meat diet and an avoidance of bread, potatoes, and farinaceous food generally; while to the third class he proscribes the use of sugar and fat. Dr. Browne is fond of pointing out the incalculable harm done to the digestive system by an immoderate indulgence in tea, and in his, as in every medical out-patient room, he finds abundant illustrations of his observations. These cases he styles "tea dyspepsia," and he relies for a cure of them upon a daily allowance of wine, regularity of meals, and abstinence from tea. He insists very strongly on the necessity of wearing flannel, especially in the rheumatic diathesis, enjoining upon his patients the use not only of flannel jackets or shirts, but also of flannel drawers and woollen stockings; and he invariably adds this precept—"Never wear during the night the flannel clothing you have worn during the day, but change your flannel garments night and morning, taking care to have them well aired and dried in the meantime."—*Medical Times and Gazette*, *July* 25, 1868, *p.* 93.

36.—ON SULPHUROUS ACID IN THE TREATMENT OF PYROSIS.

By Dr. Henry Lawson, Assistant Physician to St. Mary's Hospital.

The very remarkable cures recorded by Dr. Dewar and Mr. Pairman, as having been effected by the use of pure sulphur vapour, led me to give sulphurous acid a trial in cases of pyrosis, and certainly the result surprised me. *In every instance in which it has been employed it has, in a very short time, completely arrested the water-brash secretion.* Indeed, it has given me so much confi-

dence in its valuable action, that I now never hesitate to assure the patient he may very soon hope for relief from at least the distressing symptom of pyrosis. Dr. Dewar and Mr. Pairman have advocated the use of sulphurous acid to a degree that I should be far from accepting, and have been, in my opinion, over-zealous in urging its claims as a panacea. But for all this, I am disposed to think its usefulness in conditions of pyrosis can hardly be over-rated. It checks the excessive secretion, stops the vomiting and lessens the epigastric dragging pain so often complained of.

What is the explanation of its action? This is a question which is especially interesting just now, but which it is impossible to answer definitively in the present state of science. Some would say its good effects are due to the production of ozone and the destruction of vegetable germs, and among these I desire provisionally to rank myself. Others would, perhaps, urge that it has some special action on the mucous membrane. It is a significant fact, first, that in all the specimens of water-brash immense quantities of vegetable organisms are present; and, secondly, that sulphurous acid is fatal to these structures. I have made numerous microscopic examinations of the fluid of pyrosis, and nearly in every instance I have detected not only sarcinæ (which Kühne holds to have no fermentative power on sugar) and torulæ, but huge clusters of leptothrix and myriads of vibrions, and backteria.

Pasteur has shown the vast influence which these latter bodies have in promoting certain fermentation, and it is only natural to suppose that the sulphurous acid, by destroying them, checks these unusual processes. That the clusters of leptothrix are productive of irritation (hence possibly of undue secretion), must be evident from the manner in which they are buried and rooted in the very substance of the epithelium particles. Whatever, then, may be the relation of an unhealthy condition of the stomach to the first development of these vegetable forms in its walls, I am induced for the present to infer that their continual presence is productive of the excess and alteration of the gastric secretion, and that the reason why sulphurous acid is so beneficial, is simply that it is a parasiticide.

The doses in which I have given the acid (B. P.) vary from ℥xxx to ʒj three times a day, shortly before meals. Bitter infusions may be employed as a vehicle, but plain distilled water is best. I have seldom heard patients complain of any unpleasant effects of the medicine.—*The Practitioner*, *Sept.* 1868, *p.* 169.

37.—ON CHOLERA AND DIARRHŒA.

By Sir Thomas Watson, Bart., M.D., F.R.S.

[There are two conflicting theories as to the pathology of cholera. The whole question is fully put before the reader in the following paper.]

It is acknowledged on all hands that the primary and special danger in cholera lies in the period of collapse. Now it was a very natural and plausible theory which attributed this state of collapse to the drain of fluid matters from the blood by the profuse and repeated fluxes from the stomach and bowels; and the practice suggested, as a direct corollary to this theory, was that of endeavouring to arrest the destructive flux by astringent drugs and by opium, and to restore the spent strength and the lost animal warmth by alcoholic and other stimulants.

It is affirmed, on the other hand, that the condition called collapse is not due to the excessive discharges from the body; that those discharges are really eliminative of the poison, or of the products of the poison, which caused the disease, and are to be permitted, or even encouraged, rather than checked; and, therefore, that astringents and opiates can do no good, but are, on the contrary, positively hurtful.

Were the first mentioned theory true, there must be a discernable relation between the alleged cause and its effect. The greater the amount of the intestinal discharges, the more certain and the more decided should be the

resulting collapse. But no such proportion has, in fact, been observed. Nay, the very reverse not seldom obtains. The most hopeless cases are those of collapse after very scanty discharges, or with no discharges at all.

Again, if the collapse were indeed owing to the drain upon the blood effected through the intestinal discharges, it would be prolonged, deepened, and rendered more perilous, by the continuance of those discharges; whereas it is notorious that patients emerge from the state of collapse while the evacuations go on, and that the cessation of the evacuations during collapse is a fatal sign.

Tested, then, by the evidence of acknowledged facts, this theory must be pronounced a failure, and the treatment founded upon it a mistake.

In truth, a fallacious analogy has been assumed between the collapse or exhaustion arising from a drain upon the blood and the collapse in cholera. In one single point—namely, the smallness and weakness of the arterial pulse (in other words, the defective circulation of the blood)—the two may seem to touch each other. In almost every other point, they differ widely. A person exhausted by loss of blood, or by a long continued drain upon that fluid, is in a state that is very near to syncope. When the exhaustion is extreme, if he assume the erect posture, he faints outright, and becomes unconscious. To walk, to stand, or even to sit up, is simply impossible; whereas, in the collapse of cholera, syncope is well-nigh unknown. The patient, with death stamped apparently upon his features, with no pulse to be felt at his wrist, with a blue and icy-cold skin, is not faint, but able to walk about the room, and to perform many of his usual functions. The exhausted man, if he recover, recovers slowly; the repair of his impoverished blood is necessarily a gradual process. The cholera patient rallies from his collapse at once, if at all. He may be in full collapse to-day, and convalescent the day after to-morrow, and apparently but little the worse for the terrible disorder through which he has so recently passed. "I have seen," says Mr. Grainger, "a man stand at his door on Wednesday, who on Monday was in perfect collapse." Again, the way in which remedies tell upon the two contrasted conditions is totally and instructively unlike. The coldness and faintness of exhaustion are relieved at once by a glass of wine or of brandy; the pulse instantly acknowledges the virtue of the stimulus. But alcholic stimulants do not warm or invigorate, even for a moment, the patient in choleraic collapse; rather, they seem to make matters worse. On the other hand, bloodletting has often brought marvellous relief under collapse; while to draw blood from a person who is fainting from exhaustion would probably ensure his death, and would certainly aggravate his danger. Take the following instance, recorded by Sir Ranald Martin, of the effect of venesection. "On visiting my hospital in the morning, the European farrier-major was reported to be dying of cholera. I found that during the night he had been drained of all the fluid portion of his blood. His appearance was surprisingly altered; his respiration was oppressed; the countenance sunk and livid; the circulation flagging in the extremities. I opened a vein in each arm; but it was long before I could obtain anything but trickling of dark treacly matter. At length the blood flowed, and by degrees the darkness was exchanged for more of the hue of nature. The farrier was not of robust health, but I bled him largely; when he, whom not a moment before I thought a dying man, stood up and exclaimed, 'Sir, you have made a new man of me.' He is still alive and well."

The question has naturally been put, "Is it possible to reconcile facts of this kind with the theory that the collapse of cholera results from the loss of the liquid constituents of the blood? If Sir R. Martin's hypothetical statement that his patient 'had been drained of all the fluid portion of his blood' were an accurate expression of facts, can we conceive it possible that he could 'have made a new man' of him by abstracting largely the blood which remained in the vessels?"

The main advocate in this country, and, as I think, the triumphant advocate, of what may be called the evacuant or cleansing practice in cholera, is your present able professor of physic, Dr. George Johnson. To him is justly

due the great merit of having established, by his persevering efforts, in the face of much opposition and discouragement, the worth and efficacy of that practice; although he was not the first to recommend or to adopt it. It was in fact tried, with favourable results, nearly half a century ago, by English practitioners in India; its professed object being that of getting rid of offensive morbid secretions. The practice thus vouched for by Dr. Johnson is directly in accordance with, and serves to confirm that view of the pathology of cholera which, by a methodical display of numerous facts, and by a process of close and conclusive reasoning, he may fairly challenge as his own. Briefly, he holds, as many before him held, that the phenomena of cholera result from the entrance of a peculiar poison into the blood, where it probably undergoes, like that of small-pox, a rapid process of self-multiplication, and spoils certain of the blood-constituents, which are then ejected through the mucous membrane of the alimentary canal; that the copious discharges are expressive of the efforts of nature to throw off a noxious material, and really form, therefore, a necessary part of the process of recovery; and that, if the pouring forth of the vascular excretion be checked (as it can, perhaps, be by opium), the risk of fatal collapse is thereby increased. He declares that the results of his own practice, founded on these views, have amply justified them; and a considerable body of other evidence has now been furnished in support of the same plan of treatment. Whatever may have been his earlier purpose, he does not now propose to *excite* discharges from the mucous surface of the digestive canal; but simply to facilitate the removal of matters lodged there. And this he would do by emetics, by draughts of tepid water or other diluents, or by castor-oil, of which the action is both speedy and gentle.

It is plain that, if "elimination" be a condition of recovery, the method of elimination is nature's method, which art may help or hinder—help by the cleansing method, hinder by the astringent.

For a full appreciation of Dr. Johnson's very novel and interesting, and to my mind satisfactory disquisitions as to the general pathology of cholera, I must refer you to his paper in the fiftieth volume of the *Medico-Chirurgical Transactions*. What we are now concerned to ascertain is the comparative result of the two conflicting methods of treatment. Upon this point there is, in the same volume of *Transactions*, a most instructive communication from Drs. M'Cloy and Robertson. They show that of 375 cases of cholera admitted into the Liverpool Parish Infirmary in the last epidemic, 161 proved fatal—a gross mortality, under all the modes of treatment adopted, of 42·93 per cent. Of these cases, 91 were treated with astringents and stimulants, camphor and iced-water, applications of ice, and hypodermic (opiate) injections; and the mortality per cent. of these cases was 71·42. 87 cases were treated with castor-oil, and with a liberal use of food and alcohol; and the mortality was 41·37 per cent. 197 cases were treated with castor-oil only, and the mortality was 30·45 per cent. The authors of the paper declare that "recovery never occurred without the continuance of the intestinal discharges, or their restoration, if previously arrested."

When I last spoke on this subject in these lectures, I stated that the few recoveries which I had witnessed had all taken place under large and repeated doses of calomel, but that I could not venture to affirm that the calomel cured them. At present, I am much disposed to believe that, by its cleansing action, the calomel may have helped the recovery; and, after all that I have since seen, heard, read, and thought upon the matter, I must confess that, in the event of my having again to deal with the disorder, I should feel bound to adopt, in its generality, the evacuant theory and practice.

Now, if this theory and practice in respect of cholera be true and right, the practice ought to be right in respect of the associated diarrhœa also; and it is strongly affirmed by those who have largely tried it, that it is right, inasmuch as it is eminently successful. Dr. Johnson avers that he has found it so.

Hear the concurring testimony of Drs. M'Cloy and Robertson. "Our experience of diarrhœa was very extensive. Several thousand cases came

under our observation in the different dispensaries connected with the West Derby Union and in the Liverpool Parish Infirmary. Among these were doubtless many which would have recovered under any mode of treatment, or by the *vis medicatrix naturæ* alone. But there were many, too, of a most severe choleraic type. The treatment adopted was generally evacuant in its nature; and consisted in the administration of castor-oil, calomel, rhubarb, or magnesia. In every case relief was afforded 'pleasantly, quickly and safely.' It was but seldom that more than two or three doses of oil were required." The medical officers of the Bootle Dispensary depose to the same effect: "We certainly had less trouble with the evacuant mode of treatment. Our patients seldom gave us a third visit; two doses of castor-oil or rhubarb mixture being generally sufficient to cure the disease. We never saw a diarrhœa patient, treated with evacuants from the commencement of his attack, require subsequent removal to hospital. In a large proportion of our cases there was 'premonitory diarrhœa' which had been treated, often for four or five days, with astringents. Diarrhœa patients undoubtedly recover when treated with astringents; but the recovery is not consequent upon the arrest of the discharges, as these are invariably restored before the patient feels well."

In the face of this and much similar evidence, I feel bound to say that the rules laid down by Dr. Johnson for the treatment and prevention of diarrhœa and cholera, seem now to me safer and better than the less discriminating advice which heretofore I gave you; "whenever a suspicion arose that cholera was present in the community, not to try, in cases of diarrhœa, to carry off the presumed offending matter, but to quiet the irritation and to stop the flux as soon as possible, by astringents, aromatics, and opiates."

No doubt, the true indication and treatment is, "to stop the flux as soon as possible;" but this may sometimes be best effected (as also in crapulous diarrhœa, and in the summer cholera of Sydenham), "*by* carrying off the offending matter."

In language chiefly his own, but partly also mine, Dr. Johnson writes as follows:—

"*Diarrhœa ought not to be neglected, even for an hour.*"

"One important and guiding rule of treatment is, *not to attempt by opiates, or by other directly repressive means, to arrest a diarrhœa, while there is reason to believe that the bowel contains a reasonable amount of morbid and offensive materials.*"

"The purging is the natural way of getting rid of the irritant cause. We may *favour* the recovery by directing the patient to drink copiously any simple diluent liquid—water (cold or tepid), toast-water, barley-water, or weak tea; and we may often accelerate the recovery by sweeping out the alimentary canal by some safe purgative, and then, if necessary, soothing it by an opiate. Castor-oil, notwithstanding its unpleasant taste, is, on the whole, the safest and best purgative for this purpose. It has the advantage of being very mild and unirritating, yet withal very quick in its action. A tablespoonful of the oil may be taken, floating on cold water, or any other simple liquid which may be preferred by the patient. A mixture of orange-juice or of lemon-juice with water forms an agreeable vehicle for the oil. If the dose be vomited, it should be repeated immediately; and the patient should lie still, and take no more liquid for half an hour, by which time the oil will have passed from the stomach into the bowels. Within an hour or two, the oil will usually have acted freely. Then a tablespoonful of brandy may be taken in some thin arrowroot or gruel; and, if there be much feeling of irritation, with a sense of sinking, from five to ten drops of laudanum may be given in cold water. These means will suffice for the speedy arrest of most cases of choleraic diarrhœa. If the patient have an insuperable objection to castor-oil, or if the oil cannot be retained on the stomach, ten or fifteen grains of powdered rhubarb, or a tablespoonful of the tincture of rhubarb, or a teaspoonful of Gregory's powder, may be substituted for the oil."

"If the diarrhœa have continued for some hours, the stools having been copious and liquid; if there be no griping pain in the bowels, no feeling or appear-

ance of distension of the intestines; the abdomen being flaccid and empty, and the tongue clean—we may conclude that the morbid agent has already purged itself away. There will, therefore, be no need for the castor-oil or other laxative; and we may immediately give the brandy in arrowroot, and the laudanum, as before directed. The rule in all cases is, *not to give the opiate until the morbid poison and its products have for the most part escaped; not to close the door until the 'enemy' has been expelled.* While there are some cases in which the evacuant dose is not required even at the commencement of the attack, there are many more in which the opiate is unnecessary in the later stage. In some cases of severe and prolonged diarrhœa, it may be necessary to repeat the oil and the laudanum alternately more than once at intervals of three or four hours. Practical skill and tact are required to discriminate these cases. It must be borne in mind that, when the choleraic secretions are being actively poured out from the blood-vessels, the bowel, though it may have been completely emptied by a dose of oil, may quickly again become filled with morbid secretions, and hence the need for an occasional repetition of the evacuant dose."

"If the diarrhœa be associated with vomiting, this should be encouraged and assisted by copious draughts of tepid water. The vomiting affords relief, partly by the stimulus which it gives to the circulation, but mainly by the speedy ejection of morbid secretions."

"If there be nausea without vomiting, and more especially if the stomach be supposed to contain undigested or unwholesome food or morbid secretions, an emetic may be given—either a teaspoonful of powdered mustard, or a tablespoonful of common salt, or twenty grains of ipecacuanha powder, in warm water."

"In all cases of severe diarrhœa, the patient should remain in bed."—*British Medical Journal, July* 18, 1868, *p.* 49.

DISEASES OF THE URINARY ORGANS.

38.—UREA AND URIC ACID; THEIR RELATION TO HEALTH AND DISEASE.

By Dr. B. Kelly.

When we take into consideration the great importance of the urine as an excrementitious liquid, and the part it has played from time immemorial in the pathology of numerous diseases, we may be somewhat surprised why its chemical composition and morbid qualities should have so little occupied, until a comparatively recent period, the attention of medical men. But if these portions of its study have been ignored and neglected, its reputed value as a *polychrest*, or useful remedy in sickness, has been recognised from a very remote antiquity.

Aristotle observed that when urine was retained unduly long in the bladder it emitted a stronger and more offensive odour after expulsion than when voided after the usual interval—a change which he justly attributed to the gross and viscid properties it thus acquired.

That the practice of *autoureposis* must have originated at an early period of the world either through the injunctions of physicians, or (which is not improbable) through the impulse and dictates of morbid imaginations, there cannot be a serious doubt; and yet disgusting and unnatural as the habit may have been, it was far exceeded in this respect by the internal use of *album græcum*, *meconium*, and the *sulphur occidentale* of Paracelsus. Celsus records the death of a favourite of King Antigonus, who died from the effects of drinking his own urine. This personage, according to the assertion of the great Roman physician, was notoriously intemperate. Pliny states that the suppressed menses are restored by the patients inhaling the warm fumes of fresh urine excreted by males under the age of puberty. The same author also believed, that as fullers were never troubled with the gout, and as stale

urine was the liquid used by them in his time for scouring woollen fabrics and other articles of clothing, it must, therefore, be an appropriate, if not an effectual, remedy for the disease in question. But indeed there was scarcely a malady in the entire nosological catalogue against which the internal and external use of urine, fresh or stale, had not been deemed a sovereign specific from the days of Celsus and Pliny down to a century or two ago. The *autouroposis* of the ancients bids fair to be revived under a modified and less disgusting form by the modern application of certain saline constituents of the urine to the treatment of disease. Even in our own day, the besotted inhabitants of Kampschatka, who eat the Amanita Muscaria for the sake of its exhilarating influence upon the animal spirits, are wont, when the supply of the fungus is exhausted, to prolong its intoxicating effects by drinking freely of the urine they excrete after its use.

The first physician I find, in looking back through the long vista of time, who seemed to have had any definite knowledge of the chemical composition of the urine, is the renowned Dr. Willis. In his treatise on the several kinds of urine, he gives a rough, but rather comprehensive, analysis of this liquid. According to him, it consists of a large quantity of serum, a less amount of salt, sulphur and earthy matter, and a small proportion of spirit. Van Helmont, the Flemish physician and chemist, who was a contemporary of Willis', bestowed considerable attention on the physical characters of the urine. That, passed on rising in the morning, he called *urina sanguinis*, in contradistinction to the *urina potûs*, or that resulting from beverages.

It is quite unnecessary to allude here to the long and illustrious list of physicians of our own times who have rendered themselves immortal by their researches in the domain of urinary pathology, as their works and achievements are fortunately well known to the profession. But, as the subject is far from being exhausted, I have deemed it not unworthy or profitless to devote a few pages to the consideration of urea and uric acid, as two of the most important proximate principles of the urine, whether in a physiological or morbid point of view, and the relation they bear to the system in health and disease.

Urea.—This substance, which results from an oxidation, or species of slow combustion of the constituent elements in the tissues, is constantly found in the blood, urine, and other organic liquids of the economy, but more especially in the lymph and vitreous humor. It is excreted from the system exclusively by the kidneys and skin in a state of health; but in Bright's disease and other organic affections of the kidneys, the gastro-intestinal mucous membrane vicariously discharges the function of the disordered glands, and effects the removal of a large share of the noxious principle from the blood. Hence the vomiting and diarrhœa which not unfrequently accompany the more advanced and serious cases of albuminuria. These accidents, being in a measure critical of the disease, and curative in their tendency, ought never to be incautiously interfered with or suddenly checked.

Whether urea be obtained as a constant and natural product of the living body, or as fabricated in the laboratory of the chemist, its physical characters and elementary constitution are always the same. Dry urea contains no water of crystallization, and, being a quarternary compound, possesses all the well-known chemical instability of such substances. Whether hydrated or anhydrous, it is readily converted by stale or putrid mucus, or by any agents capable of acting as ferments, into carbonate of ammonia. It is dimorphous, that is to say, capable of assuming two distinct crystalline forms according as it is slowly or rapidly evaporated.

Urea is in its origin and essence purely excrementitious; and where, from any cause, it is suffered to accumulate in the blood, it invariably gives rise to alarming nervous accidents, as amaurosis, convulsions, paralysis, &c., which, if neglected, usually terminates speedily in death. It also occasionally enters as an active element into the pathogeny of serous inflammations.

The first liquid of the body which contains urea in largest proportion is the

lymph. The lymphatic vessels, indeed, may be said to be purposely set apart for the special absorption and accommodation of this substance, in the same manner as the lacteals are for the imbibition and reception of the chyle. The more abundant the lymph, the more abundant, all other things being equal, will be the quantity of urea contained in it; and as the quantity of lymph increases up to a certain point in a state of abstinence, and as the individual, in such circumstances, feeds, so to speak, and subsists upon his own tissues, the proportion of urea necessarily increases, thus demonstrating the large amount of animal matter that was necessary to be consumed to supply the want of the customary food, and to keep the living machine in active motion. When abstinence, however, is prolonged to an extreme degree, so as to approach starvation, not only the serum of the lymph greatly diminishes, but its solid constituents, and notably the urea, decrease, yet not to the same extent as the watery portion of the humor.

The venous blood always contains a greater or less quantity of this substance in solution, which not only varies from one vein to another, but according as the subject of the experiment is in a state of repletion or one of abstinence. The amount of urea contained in the venous blood in the former case is relatively small, for the reason that the vessels are filled to turgidity and have barely power to support the column of blood circulating in them; while in the latter, the veins are comparatively empty and flaccid, and endosmosis of liquids with their soluble contents readily takes place through their walls. The left vena innominata contains a greater proportion of urea than all the veins of the body, from the fact that the greater thoracic duct empties its contents into the left subclavian previous to its junction with the internal jugular of the same side; next to this vessel, the brachiocephalic of the right side contains the greatest amount of urea, more especially when the lesser thoracic duct enters it. The renal veins, for obvious reasons, contain the smallest share, and yet they are never entirely free from it either in a diseased or healthy state of the kidneys.

As a greater or less quantity of urea is always found in the blood of the renal veins, it becomes a question to decide from what source it may be derived. There are only two points to which we can legitimately trace its origin; either it must have escaped the filtering process in the kidneys, and thus directly entered the capillaries of the renal veins; or it may have penetrated the coats of the latter from the substance of the glands in which it had been formed as an effete product of nutrition. The former view in all probability is the more correct, especially in presence of the anatomical fact that the organs in question are duly supplied with lymphatics, not very abundantly, it is true, but yet sufficiently so to effect the removal of the urea as rapidly as generated. In Bright's disease, however, and in acute nephritis, the quantity of urea carried off by the renal veins is almost as great as that contained in the renal arteries.

The arterial system always contains a larger share of urea both in health and disease than the venous. When we take into consideration that, with the exception of the small quantity removed from the renal arteries, the entire mass of the urea centres here, we may well be surprised why an element so excrementitious in its nature, and so deleterious to the healthy functions of the economy when, from any cause, it has accumulated to excess in the blood, should circulate so freely in the arteries without producing any serious disturbance or perceptible change in the process of nutrition.

The existence of urea in large quantity in the vitreous humor was first verified by Millon, and has ever since puzzled scientific men to account for its presence in a secretion which is so very dissimilar to the urine both in physical and chemical characters. I have ventured to approach the vexed question, and to offer an explanation thereon, leaving it to others to judge of its correctness. We know that the vitreous humor being a permanent, recrementitial product of secretion is never absorbed, at least in no appreciable quantity in the healthy state, but remains hermetically enclosed in the cavity of the eyeball. Possessing great viscidity and consistence, its endosmotic property is also very considerable. But as urea is formed in the

tissues of the body wherever blood-vessels and lymphatics are found; and as it is dissolved by the fluids which bathe and permeate these tissues, it must necessarily enter the vitreous humor; and as it cannot possibly escape unless the humor has undergone liquefaction, it must increase by gradual and constant accessions. How far its accumulation may be instrumental in producing or aggravating certain forms of blindness and impaired vision, may become a fruitful subject of inquiry in future experimental research.

Uric Acid.—This substance resembles urea in being an organic product of nutrition, and in elementary constitution, but is entirely unlike it in its chemical affinities and reactions, as well as in physical characters. It is also unlike it in not being ever formed outside of the living system by artificial means. Besides forming stable compounds with soda, lime, potash, magnesia, and ammonia by converting them, as the case may be, into alkaline, neutral, or acid urates, it is changed into alloxan and allantoin—the highest degrees, possibly, of oxydation, if we except alloxantine and parabanic acid, to which this principle is capable of being raised—the former by nitric acid, the latter by the peroxide of lead.

Uric acid, which in the human subject is always a morbid product when it exists in excess in the blood and urine, is a normal, excrementitious principle of tissue-metamorphosis in insects, birds, and reptiles. As the nitrogenous elements abound in the systems of these animals, and very little of the fatty or carbonaceous, we can reasonably account for the enormous quantity of uric acid and urates, and the extremely small proportion of water and carbonates excreted by them. In herbivorous mammalia, on the contrary, uric acid and the urates are never found as constituent elements of their urine in its normal condition; whereas urea, the alkaline carbonates and phosphates, are abundantly formed as natural products in their systems, and are copiously discharged in their urine. When, however, such animals are kept in a state of abstinence for a time varying from twenty-four to forty-eight hours, the alkalinity of their urine disappears, and with it its usual turbidity; the excreted liquid becomes limpid, and exhibits a decided acid reaction, owing to the presence of uric acid, and acid urates and phosphates contained in it. Claude Bernard accounts for this remarkable change in the physical characters and chemical constitution of the urine of herbivora during abstinence, by referring to a counterchange which ensues in the nature of their aliments—the animals, in such circumstances, living upon their proper tissues, thus becoming, for the time being, to all intents and purposes, carnivorous.

It is known that cold-blooded animals, as reptiles, whose respiration is very slow, abundantly excrete uric acid, either free, or in combination with alkaline bases, especially ammonia. From this it has been inferred that the formation of uric acid, whenever it occurs in the human subject, results from a deficient oxydation of the nitrogenous elements of the food and tissues. Cl. Bernard, however, warns us earnestly against accepting this theory, and cites, as an illustration, the example of birds, in whose systems uric acid is freely generated, notwithstanding that their respiration is extremely rapid. Here, truly, is a dilemma—how to reconcile a uniform and constant effect with conditions and causes so diametrically opposed. For my own part, I think that the conditions in question are not so conflicting as they seem. The respiration of reptiles, it is true, is very slow; but their circulation, also, is equally torpid; there is consequently an equilibrium established between both functions. In birds the contrary of this obtains; their respiration is very active, as is, also, their circulation; their blood, too, is extremely plastic from its great richness in coagulable principles, especially fibrine. The generation of uric acid takes place, as we know, with equal uniformity in both cases under apparently different circumstances. We cannot attribute its formation exclusively to an active respiration, nor yet to a slow, we must, therefore, look to other conditions and causes than those mentioned in order to solve, with any degree of satisfaction, so perplexing a problem.

I have already stated that the nitrogenous elements abound in the systems of insects, birds, and reptiles, and that the carbonaceous or fatty matters are

greatly deficient, or only exist as secondary, or accessory constituents. Hence the great quantity of uric acid and urates (all azotized products) normally formed and eliminated by them; whereas water and the carbonates are so extremely scant as only to amount to mere traces in their excrements. Let us look again to the sheep and ox, for instance, in whose bodies are usually hoarded up such great masses of fat, and what do we find? Neither uric acid nor urates are ever discharged by them as normal excrementitious products while the alkaline carbonates and earthy phosphates are so abundantly excreted by their kidneys, that their urine may be well considered a saturated solution of these substances.

Like all other herbivorous mammalia, these animals are heated more by the combustion of their fat than by the oxydation of the nitrogenous principles of their compact tissues. The reverse of this obtains in birds and reptiles; not being furnished with the so-called calorifacient substances, or only so to a very limited degree, combustion of their solid structures, and as a consequence, oxydation of their constituent elements, take place; and hence the marked disparity in the nature of their excrementitious products as compared with those of the above-named animals.

Uric acid being very sparingly soluble, requiring as it does, 10,000 parts of water at 60° for its solution, it becomes an important question to decide why it should remain soluble in the blood and urine, not being spontaneously precipitated from the latter for many hours after emission, even when it exists in abnormal quantity, as in cases of gout and rheumatism. Heat, we know, is favourable to its solubility, but when once crystallized, elevation of temperature may be carried almost to the point of decomposing it without effecting anything more than its partial solution, unless the quantity of liquid employed bears an exaggerated proportion to the amount of acid to be dissolved. It is quite possible, however, that as fermentation rapidly takes place after expulsion of the urine, under certain morbid conditions, the more soluble urates become decomposed through the agency of new-formed acids (the lactic and acetic), the substance in question is precipitated, the liberated bases being converted into lactates and acetates.

The chloride of sodium, which always exists in greater or less quantity in the blood and urine, assists materially in keeping the urate of ammonia soluble in these liquids; but I am not aware that it exerts a similar influence over uric acid.

The urates, also, are remarkable for their slight solubility in water and the urine, and may be distinguished by this character from other saline substances with which they are usually associated, and with which, as a consequence, they might readily be confounded. They become more soluble by heat, and by the addition of alkaline carbonates and phosphates, which, without decomposing them, convert them from acid salts into neutral or alkaline urates.

Urea is a natural and constant product of nutrition in the human subject so long as the functions of the organism are performed with regularity and health; but when from any cause these are deranged, the urea ceases to be formed in normal quantity, and its place becomes occupied by uric acid and its compounds. Hence we find these substances in great abundance in remittent, intermittent, typhoid and other fevers, in rheumatism, gout, and in all acute and many chronic inflammations. According to Cl. Bernard, the urea also diminishes in the urine towards the last stage of inanition. This may be explained by keeping in view the well-established fact that in the early stage of abstinence the lymph and urea are increased in absolute and relative quantity, the system as yet being vigorous and not suffering from the depressing effects of actual starvation, the animal meanwhile feeding upon his own tissues. All this is changed when he has fallen into that state of utter debility consequent upon long-continued fasting. The circulation becomes slow and languid, and in this manner keeps pace with the retarded respiration; the surface is dry and rigid, the tissues in general grow atrophied, all the organic liquids of the body—blood, lymph, urine, &c., with their constituent proximate principles—are reduced to the lowest possible ebb,

and evince a strong tendency to putrefaction, as well *in situ* as when withdrawn from the system.

Frerichs and Wöhler have found that when urate of potash had been taken into the stomach, the normal quantity of urea contained in the urine had increased. From this observation they were led to believe that the excess of urea was due to an oxydation of uric acid, which they therefore considered to be the mere exponent of the first step in the oxydation of azotized substances. M. Gallois, who repeated the same experiment, was unable to verify the result obtained by the German physiologists. On the contrary, he found that the quantity of urea usually voided in the twenty-four hours had sensibly diminished.

If oxydation is to be measured by the degree of heat evolved in the human system as in external combustible substances, we are forced to admit that the elements entering into the constitution of uric acid undergo a higher oxydising process than those of urea in the diseases mentioned. Chemical analysis of both these products confirms, I believe, the correctness of this deduction. The atomic composition of urea is thus represented:—C_2 H_4 N_2 O_2; and that of uric acid—C_{10} H_4 N_4 O_6. We here see that uric acid contains oxygen in the proportion of 6 to 18, or one-third of the other equivalents; whereas urea only contains the same gas in the ratio of 2 to 8, or one-quarter of the whole. I myself have for a long time adhered to the doctrine still accepted by continental, and by most, if not all, American physicians, which maintains that the formation of uric acid is the result of a lower degree of oxydation of the elements that compose it than that of the same elements constituting urea. I have renounced it, however, from conviction, but am prepared to acknowledge my error when proved to be wrong.—*Medical Press and Circular, July* 22, 1868, *p.* 72.

39.—ON CERTAIN DISEASES OF THE BLADDER: PARALYSIS; ATONY; JUVENILE INCONTINENCE.

By Sir Henry Thompson, Surgeon to University College Hospital.

[The patient whose case commences the following paper was nearly sixty years of age; he had passed his water much too frequently for five or six years. He also stated that]

Lately it has come away without his knowledge during sleep; that when he makes an effort at work the same thing often happens; that the stream is weak, falling almost perpendicularly; that he has "no particular pain," but is not so strong as formerly, having become much weaker of late; and that for the last few months the urine has been cloudy and has had a disagreeable smell. With all this his ordinary functions had been fairly performed, and he had followed his daily labour until three weeks ago.

The man was desired to unfasten his dress; as he did so you remarked a urinous odour, and that certain cloths which did duty for an india-rubber receptacle—a luxury beyond the means of our patient—were wet with the secretion. Two conditions only could cause this unhappy state of things: either the bladder was incapable of doing its duty as a reservoir, and permitted the urine to escape as fast as it entered from the ureters, or it was unable to expel its contents, so that it was over-distended by them, the surplus oozing out, or being forced out, in the manner described.

Now a glance of the eye might have nearly sufficed to settle this question. I pointed out a marked protuberance above the pubic symphysis; and after placing the patient on his back, the dulness by percussion corresponding with that spot, and the clear bowel-note all round, diminished the doubt as to its nature, if any yet existed. Still, this was not quite all that it was necessary to know; it was just possible that the swelling might be a solid tumour of the bladder, occupying its proper space and much more, and so destroying its function as a reservoir. To the hand, however, the protuberance was clearly made up of fluid; but even this is short of absolute demonstration,

for the most practised hand has been known sometimes to "lose its cunning," or to have found a too deceptive quality in the object handled. Finally, you saw that a well-curved gum catheter glided into the bladder, and upwards of 40 oz. of somewhat stale urine flowed off. I then examined the prostate, and found no very obvious enlargement.

Now was this a case of "paralysis of the bladder"? Certainly not. His history showed that he had had no seizure of any kind; and I beg you to understand that without some change in a nervous centre there is no paralysis of the bladder. This term is applied, or rather misapplied, every day to such cases as the one before us, and with the result not merely of masking the true pathological state, which ought always if possible to be indicated by a nosological term, but of misleading the inquirer, since it indicates a condition which by no means exists.

What, then, is the defect or disease occasioning the symptoms in this case? Probably, atony of the bladder; I will speak presently with more precision. The bladder fails to expel its contents in the two following conditions: either a growth from the prostate, by no means necessarily large, obstructs the neck, so that the natural power of a healthy bladder—which may, moreover, have been reinforced for the difficulty, by hypertrophy of its fibres rendering it stronger—cannot propel the urine by or over the obstruction into the urethra; or these muscular fibres of the bladder are so enfeebled, or even atrophied, that their propelling power is lost or greatly diminished, and the organ becomes a thin flaccid bag, and can exert no expulsive force upon its contents.

The two conditions sometimes coincide. We may have hypertrophy of the bladder following obstruction from stricture of the urethra. On the other hand, with obstruction from the prostate, the vesical coats sometimes extend and become thin. But atony may be produced without any disease of the prostate, and then mainly from the subject of it having been placed in circumstances which obliged him to retain his urine for a too considerable period, so that the bladder became over distended, and has failed subsequently to regain its tone. Unfortunately, a single error of this kind will sometimes produce an irremediable atony.

Now on further questioning our patient we did not find that he could recall any such instance, nor that he ever formed the habit of permitting such over-distension. Neither did the affection occur suddenly; on the contrary, the symptoms appeared gradually. What is still more significant is, that they occurred just at the time of life when prostatic hypertrophy commences, if it appears at all. Still, the prostate was not obviously large on examination by the bowel. We arrive, then, at the following conclusions:—That this man has some enlargement of the prostate, which, though not obvious in the rectum, consists in a small nipple-like projection of the median portion, occluding the neck of the bladder, and that, from the size of the bladder, as just now demonstrated by percussion, and by its contents, its walls are thin, and have lost their contractile power, in other words, are in a condition of atony.

I think there is no escape from these conclusions, and I beg that you will not only never permit yourselves to allude to this condition as "paralysis," but that you will protest against so loose and improper a use of the term when you hear of it thus misapplied by others. Now true paralysis of the bladder occurs from injury to the spine, and also as one of that large group of symptoms which result from disease in the cerebral or cerebro-spinal centres. You find it associated with slightly unsteady gait, with impaired articulation, or with some of the slighter signs of such central mischief, as well as with those which are most obvious; and I have even found it persisting after all other signs have nearly—I cannot say quite—disappeared.

In all cases, as in that of this patient in the ward, it is essential to empty the bladder by means of the gum catheter three or four times daily, to remove the urine completely, and at least to offer the possibility of reacquiring power to the muscular coat, which does not exist so long as that coat remains constantly distended by the retained urine.

Next, for pure atony and for slight paralysis, uncomplicated with prostatic enlargement, a little aid may be sometimes afforded to the patient through the agency of electricity, by cold douches and injections, and by tonics; but less advantage is to be derived from these means, in my opinion, than some have appeared to believe, although I by no means say these are not sometimes serviceable. I have seen an increase of expulsive power attained rapidly during the daily application of an electro-magnetic current to the bladder, and in the following manner:—To one pole the ordinary handle and moist sponge are attached, which is placed over the lumbar vertebræ; an elastic bougie, containing a conducting wire, and tipped with metal, is attached to the other pole, and is introduced into the bladder. A weak current is set going, and its effects watched. Thus a slight sensation only is to be produced. Move the bougie about gently in contact with the walls of the bladder, the urine having been just withdrawn; and, finally, let it rest a little in the neck of the bladder, where greater discomfort is felt; in all allowing the current to pass for eight or ten minutes before withdrawing.

A very different condition to that just described sometimes results after severe lesion, and also after local injury—viz., inability on the part of the bladder to act in any way as a reservoir. In this unfortunate situation the urine leaves the organ by the urethra as fast as it enters by the ureters. This is complete incontinence, in the true sense of the term. Little else than mechanical contrivances are of any avail. And these consist in making a reservoir outside instead of inside the body; one which can be emptied a the patient's will. Happily such cases are very rare.

But there is a partial incontinence which is very common, and which is, moreover, amenable to treatment. You will be consulted by an anxious mother who, bringing her boy or a girl of any age below puberty and occasionally above that period, tells you that every night, or nearly so, this young person wets the bed. Examples of this are frequently seen in my out-patient room. You know that, in a child with a busy excitable brain, muscular movements occur during sleep of a much more active character than those which usually occur in the adult, or in children of more placid temperament. Anything up to somnambulism may take place during sleep in a child whose *physique* is weak, and the slave of a restless, ceaseless activity of mind; and micturition during sleep often occurs in connexion with this state. Clearly, however, not only in such cases; for in some very dull and stupid children, in whom intelligence appears to be below the average, the same thing may happen. And it must also be admitted that there are cases which do not fall into either of these classes. For such unfortunate patients all sorts of remedies and all kinds of management are adopted, including even a periodical employment of the birch—a species of the "cytisus" which I trust you will never admit into your own therapeutic scheme. Depend upon it that "punishment" for this form of youthful frailty will not answer; and whatever of morality may be taught in obedience to the ancient injunction not to spare the rod—a question beyond our province to discuss,—do not regard it as binding on us who practise the healing art. The child's attendants often lose patience at the perpetual recurrence of the disagreeable infirmity, and believe it to be the result of wilfulness or of carelessness. I have seen much cruelty practised, even by the nearest relatives of these unhappy offenders. Give it no countenance whatever.

Now for treatment, briefly, and as much as I can on general principles. For class the first, you will cultivate the physical side of life: remove as much as possible the sources of over mental stimulation; strengthen the constitution through the agency of diet, country air, or sea-bathing if possible, and give steel wine and cod-liver oil. For class the second—those of torpid and deficient intelligence,—you must show the importance of developing mind. Endeavour to call the will into play as much as possible, and enlist it to aid you in preventing the act. These are the children who are usually ill-treated; instead of which they must be made sensible of the degradation of the habit, so as to get a stimulus for volition in relation to it.

Here remedies which act specifically on the organs are most appropriate. First and chiefest, belladonna; which apparently paralyses the expulsive muscles of the bladder and the sensitiveness of the organ at the same time. Thus in elderly people who have feeble power to expel the urine, a dose often produces complete retention, and that for some time unaccompanied by consciousness of inconvenience from it. You give small doses, say of the tincture, in the afternoon and evening, increasing gradually when it may be necessary; and if the bladder is thus made to retain the urine all night for a few weeks, on relaxing the dose gradually the habit of retaining is found to be formed and to persist. This remedy is so excellent a one that it has almost superseded blisters to the sacrum and such counter-irritants. After it, nux vomica may be tried. Then, for confirmed cases, after the failure of other treatment, especially for those who have arrived at puberty or thereabouts, a mild caustic solution to the prostatic urethra—say ten grains to the ounce of water—has answered in my hands; to be repeated with a stronger solution if necessary.

In all cases inquire carefully for derangements of digestion, in all its stages, from primary stomach symptoms to worms in the lower bowel—not unfruitful in their adverse influence. Of course you will take care that the child has not too much fluid, nor takes too much of solid food containing much water in its composition, during the latter third of the day; and that it is taken up to pass water late in the evening when its attendants go to bed.—*Lancet, July* 18, 1868, *p.* 69.

40.—TREATMENT OF DIABETES BY PEROXIDE OF HYDROGEN.

By Samuel J. Bayfield, Esq.

A gentleman, aged 46, engaged in commerce, of steady habits, and a moderate liver, suffered from diabetes, for a year and a half, and had been the whole time under treatment of some of the best practitioners in London, and receiving no benefit, lost both faith and patience, and applied to me; after hearing his statement, and examining his prescriptions, I felt I could not give even feeble hopes of benefit. But it occurring to me that Dr. Gay, of Geelong, some time since, published in the Lancet the result of the successful treatment of a case under unfavourable circumstances by the use of the ethereal essence of the peroxide of hydrogen in drachm doses three times a day in distilled water, I was determined to try the effect of the remedy upon my patient. I began with half-drachm doses, and gradually increased to the drachm. I also materially relaxed the rigidness of his diet, and discontinued much that was disagreeable and objectionable for one more consonant to his taste and appetite. I have much pleasure in announcing, after about ten weeks' steady perseverance, with occasional fluctuations, he quite recovered, and has kept well for several weeks; he is now in the country for the benefit of change of air; he is gaining both strength and flesh; and he writes home in a strain both hopeful and thankful. I have not troubled you with daily details, for they would be uninteresting and tedious.—*British Med. Journal, Oct.* 17, 1868, *p.* 423.

41.—SYPHILITIC ALBUMINURIA TREATED BY THE CALOMEL VAPOUR BATH.

By Henry Lee, Esq., Surgeon to St. George's Hospital.

[The patient whose case forms the subject of this article was a tall man, 38 years of age. He was attended at first by Dr. Cumberbatch alone.]

He then suffered from frequent desire to pass his water, which was intensely albuminous. There was great cachexia, anæmia, and debility. He was ordered tonics, and to winter abroad. In February, 1866, he com-

plained of pains in some of his bones. A large soft node formed on the upper part of the forearm, and one of the ribs became carious; a considerable discharge took place from both these situations. There was great prostration, nausea, and loss of flesh.

I met Dr. Cumberbatch in consultation in March, 1866. The patient had then sinuses in the forearm and over the ribs, leading down in both situations to exposed bone. As there was a syphilitic history, although dating from a very remote period, it was thought that the caries had its origin in specific disease; and that the affection of the kidneys might possibly depend upon the same cause. Under this impression, the patient was directed to take a calomel bath every night before going to bed. This he did for eight or nine weeks with great regularity. He took also, at different times, a considerable quantity of sarsaparilla, sulphite of soda, and nitro-muriatic acid. Under this treatment the discharge gradually diminished, and the sinuses soon completely closed. The albumen in the urine remained for a time apparently much the same; it then gradually diminished, and at the end of six months it had entirely disappeared.

This gentleman has again lately been under my care. He had then greatly improved in appearance. His skin was soft and moist; the urine was quite free from albumen; and he had increased in weight.

We were, at the institution of the Clinical Society, forcibly reminded by Sir Thomas Watson of the great gap that exists between the knowledge of certain diseased conditions, and the application of remedies for the cure or relief of these conditions. If it be the principal object of this Society to trace "distinctly and clearly what is the action of drugs and of other outward influences upon the bodily organs and functions," I trust that the case which I have read will be considered one in point. I am aware how difficult it is in any case to say that a patient has been "cured" of his disease. The term, in fact, has by a great many been nearly abandoned. In the last report of surgical patients at St. George's Hospital, four only were reported as cured. Still that there are some remedies which have a great influence in curing diseases, and some diseases which admit of being cured, I do firmly believe; and I think the case which I have related may fairly be said to have been cured by the remedies employed. The principal and most powerful therapeutical agent used was the calomel bath. Of the effects of this mode of treatment I may now claim to have had very considerable experience. One of its great advantages is that all increased action is determined to the skin; and that consequently, irritation of internal organs, whether from the effects of the disease or of the remedy, is thereby counteracted. Salivation can rarely take place when the skin acts properly; and as a matter of fact, I think that I am able to say, when the calomel bath is used in the early stages of syphilis, that the internal organs are very seldom indeed affected.

I know that it has been doubted by some whether calomel, applied in the form of vapour to the surface of the body, is absorbed by the skin. This might be discussed on physiological grounds, but it is with the practical and therapeutical results that we are here concerned. That calomel, as such, enters the circulation, I do not wish to undertake to prove. But that the calomel bath, when properly administered, produces all the therapeutical actions which can be produced by the administration of mercury internally or by inunction, I am fully convinced; and, moreover, that it does so without impairing the powers of the constitution or deranging the internal economy in anything like the same degree.

The effect of the calomel bath is increased when the vapour is inhaled; in other words, the mucous membrane absorbs more readily than the skin. But when the medicine is introduced into the patient's system by inhalation alone, the results prove very far from satisfactory. I made, some time ago, some comparative experiments upon this point, and I found that the cases which were treated by the inhalation of calomel vapour alone, from one cause or another, all proved unsatisfactory. Where it can be so managed, perhaps the best way is to introduce the mercury through the skin only. This may not unfrequently be done, but the power of absorption through

the skin varies very much in different cases. Often the symptoms will disappear without the gums showing any sign of mercurial action; and this will be the case as well with regard to those symptoms which have been previously of long continuance as those which are of recent date. In some cases, where the skin is dry and hard, it has to be softened before any sensible effect is produced either upon the disease or upon the patient's system. Where the skin is already in a good condition, the effects of the baths may be looked for very soon.

A gentleman was some time ago under my care who had for years been in the habit of taking Turkish baths, and otherwise paying great attention to his skin, and, as far as that was concerned, he was certainly in very perfect condition. He had well-marked primary symptoms, and a distinct secondary eruption commencing on the body. He was ordered calomel baths, and his mouth very soon became affected. He then continued the baths occasionally for a period of about three months, taking as much care as he could not to inhale the vapour of the calomel. This gentleman would seldom take a bath on two successive days without an increased effect being visible on his gums. He adopted no other specific treatment. He recovered, and has remained well.

In one of the earlier communications to this society the influence of the skin on the secretion of the kidneys was ably pointed out; and it might be supposed that in the case related the benefit derived may have been due in part to the perspiration produced on the surface. It is not improbable that such may have been the case; but when it is considered that the urine remained intensely albuminous during the whole of the year 1865, and during parts of the years 1864 and 1866, and that it may have been in the same condition for a long time before the patient came under observation, it must, I think, be allowed that a disease here existed which could not be ascribed to any mere functional derangement.

The calomel bath has this additional advantage over other modes of mercurial treatment, namely, that it may be employed in states of extreme debility of the constitution. In the case which I have related no one, I presume, would have thought of giving mercury internally, and very few, if any, would have suggested mercurial inunction.

Since the reintroduction of the calomel bath, it has been used, perhaps, more extensively in some other countries than in England. Dr. Lanesford P. Yandall, a delegate from the Kentucky State Medical Society to the Medical Congress lately held in Paris, was good enough to give me the following particulars of its use, derived from his personal observation. He says: "Fifteen years since my brother, Dr. D. W. Yandall, began the use of the baths. Since that period I have knowledge of about 1500 cases of constitutional syphilis treated by the baths in his practice and my own. We first employed the black oxide of mercury, the red bisulphuret, and the iodide; but for ten years have employed calomel only. We have treated every form of constitutional disease by the fumigation, and (except in a few cases of tertiary syphilis, where mercury had been improperly and excessively used) I cannot recall a case which failed to be relieved. We have frequently found alopecia arrested after the first bath. I believe, as a rule, an improvement may be observed after the third or fourth bath. The ulcerations of the throat then cease to progress, and eruptions on the skin begin to fade. We use a drachm of calomel every night for six nights in the week. We sweat the patient profusely, and keep him in the bath from twenty-five to forty-five minutes. As a rule, a course of baths extends over a period varying from six weeks to two months. I have never seen a patient salivated under these baths. Swelling and tenderness of the gums have been the greatest effects produced. The patients have never lost flesh during the treatment; but have, as a rule, on the contrary, improved in appetite and increased in weight. I remember one patient who in sixty-two days gained thirty-one pounds of flesh. He was profusely sweated six times a week. I have never seen any ill-effects follow this treatment; and, so far as I have been able to keep my eye on the cases, relapses have been *decidedly* the exception to the rule. At the

present time I know the whereabouts of probably a hundred persons cured of syphilis by the baths, some as far back as fifteen years, and none of a later date than eight years, who have had no relapse. Some of these patients have since married, and in none of the instances have the wives or children shown any symptoms of syphilitic poisoning. Dr. David W. Yandall was the first to introduce this treatment into the Southern States. At the present time it is the favourite treatment in all the large cities, having almost entirely superseded all others. I am sure that its troublesomeness to the medical practitioner is the only obstacle to its universal use."

Such is Dr. Yandall's statement, which I have given in his own words. The quantity of calomel which he uses is considerably more than I have been in the habit of employing, and he also produces a much greater amount of perspiration than I have thought necessary. The degree of perspiration is very much influenced by the amount of water used in the bath. The water acts as a carrier of heat. An amount of heat becomes latent as the water boils, and is given out again as the vapour condenses on the patient's body. The vapour of water is a very important part of the bath. It not only softens and warms the skin, but it prevents the muriatic acid which calomel gives off when heated from irritating the lungs. The want of some convenient means of doing this was probably the reason why the calomel vapour-bath was not long ago brought into general use. But if the vapour of water be in excess, I have thought that it interferes with the action of the calomel, and I therefore direct only just as much to be used as shall produce a slight moisture on the skin, and sufficiently dilute any irritating vapour which may arise from the heated calomel. In some cases the patients will not bear sweating well. In cases of extreme debility, although they may be benefitted by the calomel, yet their weakness is increased by much perspiration.—*Lancet, July* 25, 1868, *p.* 109.

SURGERY.

BONES, JOINTS, ETC.—AMPUTATIONS, FRACTURES, DISLOCATIONS.

42.—REDUCTION OF DISLOCATION OF THE SHOULDER-JOINT BY MANIPULATION.

By Dr. James Pitcairn Bookless, Kelso.

Having read, with considerable interest, an article in the number of this Journal for May 1867, by Mr. Annandale, Lecturer on Surgery, &c., "On the Reduction of Dislocations of the Hip-Joint by Manipulation," I determined at that time to try what seemed so simple a method of operation whenever an occasion should present itself. Since then I have successfully treated various dislocations, principally of the shoulder-joint, and in them all put in force the usually received plans of reduction. Somehow I had not courage enough to try "manipulation" in any of those cases; but lately, an occasion offered where I *did* employ this method, with such success, that I have made a few notes of the case, in the hope that they may be of use in inducing others to substitute for the harsher methods of reduction a plan which, leaving out the question of chloroform, and according to the testimony of others than myself, is so simple, so speedy, and at the same time so sparing of agony to the sufferer.

On the afternoon of December 20, 1867, I was summoned to the country to attend a man who, according to the messenger's story, "had knocked his shoulder-blade out of joint." On arriving, I found upon examination that my patient, a stout strong man of about fifty years of age, had dislocated his right shoulder downwards, eight hours before, from a twist he had received by the act of pulling up a horse on the verge of falling. He was suffering great pain and there was considerable swelling of the arm. I immediately sent out to procure the assistance of some labourers in the field, so that they might be at hand in the event of my not succeeding with the method I intended to adopt, viz., "the heel in the axilla." My patient and I meanwhile were left alone, and I could not resist the temptation to try the plan I had so often thought of pursuing.

We both stood in the middle of the room, side by side, in a position where our right shoulders almost touched each other—so that, while my patient looked "eyes front," I looked in the contrary direction. I now seized his right hand with my left, at the same time separating his arm from the side. I then passed my right arm underneath his axilla—hugging the humerus. While I placed my right leg behind his right leg, I brought his hand underneath my right arm with my left. I now raised the humerus forcibly upwards with my right, and bent his elbow under the same arm, pressing downwards. At the same moment I directed him to fall away from me with his whole weight, and in a moment, crack went the head of the humerus into its proper place. The operation scarcely lasted one minute; and so sudden had been the transition from agony to joy, that he laughingly informed me, that "it was just like gettin' a *teeth* drawn, but no half sae sair." The surprise of the good woman of the house and her followers, who rushed into the room

in a violent hurry, ten minutes afterwards, can be better imagined than described.

The position to an onlooker is exactly that known by the name of the "bend" in the wrestling world, where you try to throw your opponent—failing in which you go yourself; the only difference being in this case, and that a most important one, that the operator is the only one trying to throw, as it were, so that, whether he succeeds or not, nobody falls.

Viewing this method of reduction as an example of a lever of the first order, the operator's left hand, with the assistance of the patient's body, forms the power; his right arm hugging the humerus, the fulcrum; and the head of the humerus, combined with the forces which retain it in its unnatural position, the weight.—*Edinburgh Medical Journal, June* 1868, *p.* 1103.

43.—AMPUTATION AT THE KNEE-JOINT.

By Dr. J. Brinton, Philadelphia.

[The following article is an abstract of one published in the American Journal of the Medical Sciences (April 1868). A distinction is to be made between amputation at the knee and amputation at the knee-joint.]

In the latter, the femur is sawn through above the articulation; whilst, in the former, the condyles, and sometimes the patella, are retained with their incrusting cartilages—an important modification just performed in England by Mr. Lane, of St. Mary's Hospital, and afterwards by Sir W. Fergusson, Mr. Coulson, and others. The whole number of recorded cases of amputation at the knee-joint during the American war was 211; of these, 96 recovered, 106 died, and the results in 9 were undetermined. Reamputation of the thigh was resorted to in 12 cases, in 8 successfully, and in 3 fatally. The average mortality of the whole number of cases is thus 50·2. The mortality of thigh-amputations performed during the same period was 64·43 per cent. The following are the chief results of amputation at the knee-joint in American civil practice. The total number of cases was 64, of which 7 were under the care of Dr. Brinton; primary amputations after accidents, 24 cases, with 16 recoveries and 8 deaths; secondary amputations after accidents, 20 cases, 13 recoveries and 7 deaths; secondary amputation for disease, 18 cases, 15 recoveries, and 3 deaths. The mortality was thus 28 per cent., that of European practice being 27·65 per cent.; since, in 47 collected cases, there were 34 recoveries and 13 deaths. The mortality for thigh-amputations is in America about 41·4 per cent.; in Paris, 62·6 per cent.; and in Great Britain, from 50 to 70 per cent. The death-rate from amputations of the leg below the knee is about 35 per cent. The diminished mortality of amputation at the knee, compared with removal of the limb above or below the joint, is attributed by Dr. Brinton to diminished shock of operation, which is a marked feature of the operation; to the nature of the tissues involved, and the small extent of the suppurating surface; and, finally, to the fact that the shaft of the femur is not sawn across. Dr. Brinton's experience in military practice has convinced him that, in all amputations in continuity, the patient's immunity from osteo-myelitis and subsequent pyæmic poisoning is greatly influenced by the point at which the saw is applied. The nearer to the centre of the bone this is done, the greater, probably, will be the chances of inflammation and disastrous sequelæ. In writing of the danger of amputation at the knee-joint, Dr. Brinton asserts that subsequent synovial inflammation, which is feared by some operators, is in reality but an imaginary peril. One serious condition of occasional occurrence is inflammation of the tendinous sheaths of the biceps, sartorius, semimembranosus, semitendinosus, and gracilis muscles, which is rapid in its course, and leads to suppuration. In all the operations which have come within Dr. Brinton's observation, the result as to value of the stump has been favourable. "There is seldom any tenderness on pressure; the patient generally bears his weight freely upon

the end of the stump, and can use an artificial limb with ease and comfort." —*British Medical Journal, August* 29, 1868, *p.* 223.

44.—ACUTE SYNOVITIS OF THE KNEE-JOINT; SUPPURATION; TREATMENT BY CARBOLIC ACID.

By Dr. T. Hamilton, Canonbury, London.

On Monday, the 22nd of June last, I was called to see I. M., a young woman aged 22. She told me that whilst at work three days before she was seized suddenly with pain in her left knee, which swelled soon afterwards. Since then the pain and swelling had increased. I found the joint much swollen and red, with distinct fluctuation on each side. Ordered hot fomentations and rest. During the next three days, she continued in much the same state.

On Friday, June 26th, as suppuration had evidently taken place, having previously dipped the knife in a strong solution of carbolic acid, I evacuated between six and eight ounces of pus, by incisions about an inch and a half long, on each side of the joint. I allowed the matter to escape under what Mr. Lister has termed the antiseptic veil. A paste of carbolic acid, linseed oil, one part to three, and whiting, was applied to the wounds on lead paper. (I could not obtain tin-foil.) Slight pressure was placed on the sac of the abscess by two pads of lint on each side of the joint with a bandage.

Next day I found the patient free of all pain. Pulse 80. Had slept well. On removing the dressings, a little bloody serum escaped, but no pus, and since then none has come from the wounds.

For the next four days I applied the carbolic paste, but each day weaker.

July 1st. Swelling entirely gone. No pain. No discharge. Wounds superficial, and nearly healed. Slight excoriation of the neighbouring cuticle, from the action of the carbolic acid, for which I applied water dressing.

This case requires no comment. The rapid cure was, without doubt, due entirely to my having adopted the plan of treatment suggested by Professor Lister; and I would venture to say that under no other form of treatment at present employed would so satisfactory a result have been obtained in six days from laying open the joint.

To-day (July 2nd), though I still keep the joint comparatively at rest, the patient can move it freely without the least pain.—*Lancet, July* 11, 1868, *p.* 40.

45.—ON THE ANTISEPTIC SYSTEM OF TREATMENT IN SURGERY.

By Joseph Lister, Esq., F.R.S., Professor of Surgery in the University of Glasgow.

[The mere use of carbolic acid as a dressing to a wound has long been practised in many parts of the world. By the antiseptic system of treatment is meant the systematic employment of some antiseptic substance, so as entirely to prevent the occurrence of putrefaction in the part concerned.]

So far from carbolic acid being a specific, it owes its virtues to properties which it possesses in common with various other substances; and results similar in kind to those obtained by its means might be got by disinfectants long familiar to British surgery, provided always that the same principles guided their employment. This statement is not made on theoretical grounds alone. About nine months after I had first treated compound fracture with carbolic acid, Mr. Campbell De Morgan published a paper "On the Use of Chloride of Zinc in Surgical Operations and Injuries," and was kind enough to send me a copy of it. By means of this salt he had obtained highly satisfactory results, though led to employ it with a very different object in view. Mr. De Morgan used chloride of zinc in the first instance in cases of cancer, upon the idea that the frequency of return of the disease

after operation might depend on the dissemination of its germs on the cut surface, and he hoped that, by applying a strong solution of the chloride to the wound so as to destroy any cancer-germs that might be scattered over it, he might diminish the chance of recurrence. Having treated cases of cancer in this way, he found that the wounds healed unusually kindly, while there was, at the same time, an absence of "animal odour," and he expressed his surprise at the small amount of "action" in the part. To myself it appeared perfectly natural that, if chloride of zinc prevented animal odour, implying that putrefaction was avoided, the wound, protected from the irritating influence of the products of decomposition, should exhibit little inflammatory disturbance. But it struck me as very remarkable that a single application of chloride of zinc to the raw surface should have the effect of preventing all odour of putrefaction for days afterwards; for I knew that in the case of carbolic acid a renewal of the antiseptic to the exterior was essential in order to prevent decomposition. Hence it appeared likely that chloride of zinc would answer better for my purpose than carbolic acid, and I determined, on the first suitable occasion, to give it a trial. It was not long before an opportunity presented itself.

Case of Compound Fracture Treated with Chloride of Zinc.—A labourer was admitted into the Infirmary with compound depressed fracture of the *os frontis*, caused by violent impact of the handle of a winch. I applied chloride of zinc solution thoroughly to the interior of the wound, and, with the view of preventing the spreading of decomposition inwards, adapted to the forehead a plate of clean block tin overlapping the sound skin for a considerable distance, a means which, as I had before ascertained, prevents the occurrence of putrefaction in the discharge from a healthy granulating sore. The tin plate was kept in position by a piece of strapping, and over all was laid a damp folded rag to absorb discharge, with directions that it should be frequently changed. The tin was not disturbed until about a week had expired, the patient meanwhile remaining free from any unfavourable symptoms, and not a drop of pus appearing. On removing the plate of metal, I found that the wound, instead of being hollow as when I had last seen it, was on a level with the surface of the forehead, being occupied by a chocolate-coloured mass which I supposed to be a clot, altered by the action of chloride of zinc. But when I scraped the surface of this material it bled, shewing that it was in reality alive and vascular. This exactly corresponded to the most striking and peculiar of the results I had seen to follow the use of carbolic acid in compound fracture (see the Lancet, March 16th, 1867), and the most likely to be mistaken for the effect of a specific action of that substance, viz., that the blood acted on by the antiseptic, though greatly altered by that action, remained susceptible of organization. Or, speaking more strictly, the product of the action of chloride of zinc upon the blood, like that of the operation of carbolic acid upon it, so soon as the irritating antiseptic material with which it was at first imbued had been withdrawn from it by diffusion into the surrounding circulation, proved a suitable pabulum for the growing elements of living tissue in the vicinity, which accordingly absorbed and appropriated it.

In the case just related, nothing could be more satisfactory than the effects of chloride of zinc. Subsequent trials, however, proved it to be very inferior to carbolic acid except in one class of cases, those, viz., in which, from the circumstances of the part concerned, it is impossible to maintain an efficient external antiseptic dressing, so that the application must be made once for all at the time of the operation. Here the permanence of the effects of chloride of zinc renders it highly valuable, as, for example, after the removal of portions of the maxillary bones. Every surgeon is familiar with the highly offensive character of the discharge for the first few days after such operations; and there can be no doubt that the fœtid state of the wound, besides being a great inconvenience to the patient and his attendants, involves a certain amount of danger. By means of chloride of zinc this complication is nearly, if not entirely avoided. In the first case of this kind in which I used it, I had to remove a considerable portion of both superior

maxillary bones, on account of epithelial cancer which had spread to them from the face. I applied the chloride of zinc solution freely to the raw surfaces at the time of the operation, and afterwards examined the breath daily, when the only smell perceptible from first to last was an occasional odour of tobacco. [Since this address was delivered, I have used chloride of zinc with great advantage after the removal of the tongue by Mr. Syme's method, in a case of epithelial cancer.]

But in ordinary cases carbolic acid is very superior to chloride of zinc, and, so far as I am able to judge, to any other antiseptic agent with which we are at present acquainted. It presents, indeed, a remarkable combination of advantages. In the first place, it possesses the essential requisite of being a most potent poison for the low forms of life which determine putrefaction, and it retains this power even though diluted to such a degree as to be almost entirely unirritating to the tissues of the human body. In the second place, it is volatile, and its vapour is quite efficacious as an antiseptic. This gives it a great advantage over chloride of zinc or any other non-volatile substance, enabling the dressings impregnated with the acid to exert their influence not only upon objects in actual contact with them, but also upon the air in their vicinity. Again, carbolic acid is a local anæsthetic, and exercises a most soothing influence upon a painful wound. Lastly, carbolic acid is soluble in a variety of liquids of very different properties, so different, for example, as water and the fixed oils; and each of these solutions has its own special value in practice, a point to which I shall have occasion to allude further on in this communication.

Case of Penetrating Wound of the Thorax and Abdomen.—On the 1st of October last, a butcher, aged 18, was admitted on account of a most serious wound of the chest, inflicted by a comrade who, angry at having a dirty bladder thrown at him by the patient, threw in return his knife, with a blade nine inches long, and keen-edged, half of which buried itself in the patient's infra-axillary region, between the ninth and tenth ribs. He himself drew out the knife, which was followed by a fearful gush of blood. Being accustomed to see blood flow, he said, "there was a spout of four inches before the fall." He was immediately taken to the hospital, where my then house-surgeon, Mr. Hector Cameron, found him blanched, his clothes drenched with blood, which was still pouring from the wound, venous in colour, and with a tendency to regurgitate during inspiration, implying that it proceeded from a wound in the lung, which was further indicated by the occurring of hæmoptysis. There was also protruding from the external wound a piece of omentum five inches long, shewing that the knife had passed through the diaphragm into the abdominal cavity. No time was to be lost, as death from hemorrhage was imminent; and Mr. Cameron judged it best to plug the wound, but at the same time to introduce an antiseptic as in compound fracture, in order to destroy any atmospheric germs that might have been drawn in during inspiration. With this object, after cutting off the protruding piece of omentum, which he kept to show me, he soaked a piece of lint with a solution of carbolic acid in four parts of boiled linseed oil, and by means of dressing forceps passed it as far as he could in every direction in the pleural cavity, repeating the application several times. He then took two strips of lint steeped in the same solution, each about a foot long and an inch in breadth, and pushed them into the pleura, one upwards the other downwards, as far as possible consistently with keeping their ends protruding externally; and, the wound being thus plugged antiseptically, he applied a sheet of paste composed of whitening mixed with the oily solution of carbolic acid before-mentioned, taking care that it was large enough to overlap the skin around the orifice by several inches in every direction, retaining it in position by strapping and bandage. It may, perhaps, be said by some of you, "Surely it was heroic practice to introduce irritating carbolic acid so freely into that important serous cavity. Would it not have been a milder and more prudent course to have plugged the wound with a piece of dry lint?" But any one who argues in this way forgets what would have been the inevitable result of such a procedure. The mass

of blood accumulated in the pleura would necessarily have been soon decomposed through the agency of the germs contained in the lint; and the putrefying mass, growing from day to day more acrid in the cavity in which it was confined, would undoubtedly have soon caused the death of the already prostrated patient. On the other hand, carbolic acid, being a local anæsthetic, is much less irritating, even when first applied, than the products of decomposition; and it also differs from the latter in this all-important point, that it soon becomes dissipated by diffusion and removed by the surrounding circulation, when, the blood on which it has acted being still amenable to organisation and absorption, the part is as favourably situated as if affected only with a subcutaneous injury. Next day, when I saw the patient for the first time, I cautiously withdrew the plugs, under the protection of a large piece of lint dipped in the oily solution of carbolic acid, and continued the use of the paste. For about ten days the patient progressed admirably, the pulse descending, the laboured rapid respirations growing less laboured and less rapid, and altogether his condition becoming so much improved that he could not be prevented from sitting up in bed, singing songs and conducting himself otherwise in an imprudent manner. Meanwhile, examination of the thorax disclosed signs of the presence of both blood and air in the pleura, such as dulness of the base and preternatural resonance of the upper and anterior part of that side of the chest, and metallic tinkling, which was well-marked. And to such an extent had this accumulation of blood and air proceeded, that the heart had been pushed over towards the right side, so that its apex beat below the right nipple. And yet this mass of blood, freely exposed to the influence of air, had not decomposed. Any putrefactive germs introduced through the external wound had been destroyed by the carbolic acid, and the air, entering the pleura through the wounded bronchial tubes, had deposited its floating organisms upon the slimy mucous secretion of those tortuous canals. Hence the patient remained free from any symptoms of irritation, and suffered only from loss of blood and the embarrassment of the respiration which was the mechanical result of the injury. But, thirteen days after the accident, profuse hæmoptysis appeared, which I was disposed to attribute to tearing open of the wound in the lung through his imprudent exertions; and this, continuing for several days, threatened entirely to exhaust his weakened frame. The expectorated blood assumed also a putrid odour, like that from gangrene of the lungs; and I was apprehensive that the putrescence might spread to the mass in the pleura. Fortunately, however, this did not occur. The bloody expectoration gradually became purulent, and then diminished in quantity till it ceased entirely. With regard to the external wound, it furnished no pus so long as the original mode of dressing was continued. In the first twenty-four hours, there was a free discharge of bloody serum; but this grew less from day to day, till, six days after the receipt of the injury, it amounted to less than a minim in forty-eight hours; and when the piece of lint, which had been kept permanently on the wound beneath the paste, was removed, between three and four weeks after the accident, a superficial sore was found, which afterwards cicatrised kindly. On November 18th, seven weeks after his admission, the apex of the heart was observed to be again beating below the left mammilla; and, finally, I may add, that he was seen a few days ago by Mr. Cameron, engaged with another butcher in driving a heard of unruly cattle through the streets, when our former patient, though still pale from anæmia, proved the more vigorous of the two in turning the animals; while his lusty exclamations, though not couched in the most decorous language, gave satisfactory evidence of the soundness of his lungs.

[In speaking of his mode of dressing Mr. Lister continues:]

Carbolic acid is soluble in liquids of very different kinds, so different for example as water and one of the fixed oils; and each solution has its own special value. Water, having little affinity for the acid, dissolves but a small quantity, only one-twentieth part of the pure crystals, and holds that small quantity very loosely, so as to permit it to act with energy on any

substance for which it has stronger attractions, and also to become soon dissipated on exposure. Hence, the watery solution is a pretty potent but transient application. Now, this is exactly what we want when we apply carbolic acid to the interior of a wound for the purpose of destroying any germs which may have been introduced into it. We require something that will act with energy for the moment; but which, as soon as it has extinguished the vitality of the septic particles, may disappear from the wound, in order that the tissues may be left free from all unnecessary irritation. The fixed oils, on the other hand, have so strong an affinity for the acid that they will mix in any proportions with it, and hold it so firmly as not to permit it to act with much energy on the tissues, or to become soon dissipated into the atmosphere. Hence an oily solution is comparatively bland but permanent in its operation. These are just the properties which are desirable for an external application. We wish it to serve as a reservoir of the acid, retaining it for twenty-four hours at least, so that it may remain constantly exerting its antiseptic influence upon the discharges that flow out beneath it. At the same time it is most important that it should be mild in its action on the surface to which it is applied, in order to avoid irritation and excoriation. It appears clear, therefore, that a watery solution is best adapted for the treatment of the interior of a wound in the first instance, while an oily preparation is suited for an external dressing.

We have next to consider the best form for the oily application. I have used various forms; of which some have proved trustworthy, and others not so. One that has shewn itself thoroughly reliable is a paste composed, like glazier's putty, of boiled linseed oil and whitening, but with the addition of about one part of carbolic acid to four of the oil. Even in the case of large abscesses, where there has been in the first instance a profuse discharge, the putty, if properly applied and retained securely in position, prevents with perfect certainty the spread of putrefaction into the interior. But the putty is a somewhat clumsy and inconvenient preparation, and I have been desirous if possible, to get rid of it. Within the last few months I have given a full trial to cloths dipped in a solution of carbolic acid in olive oil, but I am sorry to say that this method, though attractive from its simplicity, is not reliable. It is true, indeed, that we have had some beautiful cases under this mode of management; as for example the following.

Case of Compound Fracture of the Right Leg and Severe Contused Wound of the Left Foot, in a Person of Advanced Age.—On the 31st of January last, a woman aged 74 years, was admitted into the infirmary, having been run over by a heavily laden omnibus. The wheels had passed over both lower limbs, producing in the right leg compound fracture of both bones a little above the ankle, with a considerable wound on the outer side of the limb communicating with the broken fibula, and another on the opposite aspect, not directly connected with the seat of fracture. In the left limb the violence had been sustained by the foot, which presented at its inner aspect a large gaping contused wound, four inches long and two inches broad, while the skin was extensively detached, so that when a watery solution of carbolic acid had been introduced at the wound, pressure over the skin at the outer or opposite side caused some of the fluid to escape, showing that it had passed freely over the upper surface of the foot, beneath the undermined integument. She had also a wound on the forehead, two inches long, exposing the os frontis. From these various injuries she had lost a great deal of blood, and she was also suffering from contusions in other parts of the body. All the wounds were dressed with layers of lint soaked with a solution of carbolic acid in olive oil; the superficial layer, larger than the rest, being changed daily while the deeper layers were left undisturbed. Under this treatment the wound on the forehead healed without the formation of a drop of pus, and those in connection with the compound fracture were converted into superficial granulating sores, without any more disturbance, local or constitutional, than if the fracture had been a simple one; and the bones united in the usual period under the use of pasteboard splints. But the most remarkable circumstance in the case was the progress of the injury of the foot. Three

days after the accident, my house-surgeon, Mr. Appleton, observed that a considerable portion of the undermined skin on the dorsum of the foot had lost its vitality; and instead of adopting the usual course of applying wet lint or a poultice till the slough should separate, he extended the antiseptic dressings so that they over-lapped the dead portion of tissue for a considerable extent in every direction; after which, the daily changing of the superficial layer was continued as before. The result, though in strict accordance with the principles which I am endeavouring to enforce, was strikingly opposed to ordinary experience. After the subsidence of the copious sanious effusion which took place immediately after the injury, the discharge became reduced to about one minim in twenty-four hours, without any distinct appearance of pus, while the foot remained free from the slightest uneasiness, so that she moved it as usual in the bed, and imagined it perfectly recovered. Such being the case, knowing as I did, that to remove the deep dressings would be to induce, at the best, two large granulating sores which must, from that time forward, furnish a considerable amount of pus that would act as a drain upon the old lady's feeble system, I left the crust of lint and dried exudations untouched for seven weeks, at the end of which time it became spontaneously detached. On raising it, we found a narrow line of cicatrix along the inner side of the foot, complete healing by scabbing having occurred in, I suppose, the largest wound ever known to heal in that manner in the human subject. And on the dorsum of the foot, in place of the large slough, was a broad scar, a portion in the centre about as large as a fourpenny piece alone remaining unhealed; the dead tissue having, apparently, been absorbed, as none of it was found on the dressing. The superficial layer of antiseptic lint daily renewed, had answered the purpose of preventing putrefaction from spreading inwards, while the thickness of the permanent crust had kept the carbolic acid constantly supplied externally from penetrating to its deepest parts. Hence, the portion of the dressing in contact with the skin, having lost its original acid by diffusion into the circulation, before sufficient time had elapsed for granulation and suppuration to take place under the stimulating influence of the antiseptic, became a perfectly unirritating or neutral body, and the dead portion of tissue beneath it, being in like manner destitute of any stimulating properties, became amenable to absorption, like the bit of the external coat in the noose of the antiseptic ligature, or the dead bone in the case of necrosis, above related.

But, while I have mentioned this case as a good example of the behaviour of severe injuries under antiseptic management, I wish it to be distinctly understood that I do not recommend the mode of dressing adopted. For, as I have already stated, and as bitter experience in some other cases has but too clearly convinced me, it cannot be implicitly relied on. The reason why it is less trustworthy than the putty is sufficiently plain. The lint, being porous, absorbs the discharge, which, as it enters, displaces the antiseptic oil, and may thus, if profuse, establish a channel of putrescible materials from the external atmosphere to the wound. Again, when the discharge has passed through the dressing, even though it have been imbued with carbolic acid in its passage, it gives it off into the atmosphere on exposure, when it becomes again liable to putrefaction, and, having putrefied, may soak back into the porous dressing, and deprive it entirely of antiseptic virtue. For carbolic acid and the products of putrefaction exert a powerful chemical action upon each other; and, on this account, the former is a deodorant as well as an antiseptic, and, conversely, the latter, if in sufficient quantity, neutralize the acid and render it inert. In this way, I have known a dressing, consisting of several layers of the oiled lint, lose all odour of carbolic acid and acquire that of decomposition within twenty-four hours of its application.* The putty, on the other hand, being impermeable to the discharge,

* If fresh oil is assiduously supplied at short intervals by night as well as by day, this objection to oily cloths as a dressing is removed. But this would in many cases be impracticable; and, as a general rule, it is obviously undesirable, from the trouble and uncleanliness involved in it. There are situations however,—such as the perineum,—in which this is probably the best mode of management. And it may be added that, in any case where the discharge is very trifling, oiled lint, changed once in twenty-four hours, will prove sufficiently reliable.

retains the carbolic acid securely stored up, except in so far as it is exhaled from the surface to maintain a constant antiseptic action upon the blood, serum, or pus, that flows out beneath.

Impermeability to a watery fluid being thus evidently the essential cause of the superior efficacy of the putty, the chalk, which is its chief constituent, being of no other use than to give consistency to the mass, it naturally occurred to me that, if the oily vehicle of the carbolic acid were in a solid form, the chalk might be dispensed with, and the advantages of the putty might be obtained in a less bulky and more convenient form. I tried, in the first place, various kinds of *emplastra;* but these appeared objectionable on account of their adhesiveness, which is greatly increased by the admixture of carbolic acid, and which seemed likely to be mischievous by retaining the discharge. I next employed paraffine, mixed with a little wax to give it tenacity, and a little olive oil to confer the requisite softness. This certainly made, under ordinary circumstances, an effective as well as elegant substitute for the putty, being perfectly devoid of adhesiveness, while a comparatively thin layer proved secure by antiseptic. But the paraffine cerate had this great disadvantage, that, in situations where it was subjected to much movement, such as the groin, it was apt to crumble down and become useless. Meanwhile I learned that Dr. Watson, of Edinburgh, was employing soap-plaster mixed with carbolic acid, and that, though adhesive, it appeared to work well; the discharge finding its way out beneath it. Thus I was again induced to try *emplastra;* and of late we have been using what seems to answer admirably; viz., *emplastrum plumbi* mixed with one-fourth part of bees-wax to give it sufficient consistence, the carbolic acid being in the proportion of about one-tenth of the whole.* This is used as a plaster spread on calico in a layer of about one-twentieth of an inch thick, and I can recommend it as thoroughly reliable. There is a case which I am dressing with it at the present time, which I may mention on account of its interest otherwise.

Case of Old Fracture at the Ankle with Fixed Displacement of the Foot, Rectified by Aid of the Antiseptic System.—A young man, aged 29, was engaged in mooring a vessel on the 11th December, 1867, when one of the massive ropes, used for the purpose, slipped and struck him with violence at the outer and posterior aspect of the ankle, fracturing the fibula about two inches above the joint, and breaking off the internal malleolus at its base, driving the bones of the leg forwards and inwards with respect to the foot, or, in other words, producing displacement of the foot backwards and outwards. Four months after the receipt of this injury he came under my care in the infirmary, with the heel very prominent and the foot greatly everted, and firmly fixed in its abnormal position by osseous union of the fragments.

* In making the plaster with the ingredients mentioned in the text, the emplastrum plumbi and the bees-wax are melted and mixed together, and allowed to cool, till the liquid begins to thicken; the carbolic acid is then added and stirred in, which has the effect of bringing back the mass into the state of a thin liquid, which is assiduously stirred till it thickens, to prevent the wax from separating in granules. This plaster, is, however, inconveniently soft, and cannot be kept spread in stock. I have since found that by increasing the proportion of litharge, the lead-soap may be made of any degree of firmness that may be desired, provided that water be not used in the manufacture. When the litharge and olive oil are in the proportions directed by the *Pharmacopœia*, a certain quantity of water must be added to promote the combination of the fatty acids with the oxide of lead, and even then the process is a very tedious one. But it is an interesting fact chemically, that if the litharge is used in about four times the pharmacopœial proportions, although no water be employed, the combination proceeds under a brisk heat with great rapidity. It is upon this fact that the following method of manufacture is based.

Take olive oil, 12 parts by measure; litharge (finely ground), 12 parts by weight; bees-wax 8 parts by weight; crystallised carbolic acid, 2½ parts by weight.

Heat half the oil over a slow fire; then add the litharge gradually, stirring constantly till the mass becomes thick or a little stiff. Then add the other half of the oil, stirring as before till it becomes again thick. Then add the wax gradually till the liquid again thickens. Remove from the fire and add the acid, stirring briskly till thoroughly mixed. Cover up close and set aside, to allow all the residual litharge to settle; then pour off the fluid, and spread upon calico to the proper thickness. The plaster made in this way can be spread by machine and kept rolled up in stock; and, if in a well fitting tin canister, will retain its virtues for any length of time. This I believe to be the most perfect form in which an antiseptic lead-plaster can be obtained. It is supplied at a very moderate price by the New Apothecaries' Company, Glassford street, Glasgow. For almost all purposes, however, it is superseded by the lac plaster, which will be found described in the succeeding part of this address. These improvements in the materials for dressing have occupied a much longer time than I had anticipated; and have been the cause of the delay in publication.—J. L.

In this condition the limb was absolutely useless, and the question arose whether anything could be done to restore it. It was clear that the foot could not be replaced without breaking through the "callus" which could be plainly felt in both bones, and there seemed no prospect of being able to do this without cutting down and adopting means which, in the case of the tibia, would necessarily involve opening into the articulation, or producing artificially a compound fracture into the ankle joint. This I certainly should not have dreamed of doing without the aid of the antiseptic system, being well aware of the disastrous course such injuries commonly run under ordinary management. If I had operated at all, I should have made a point of removing the end of the tibia, and even then I should have felt that I was subjecting the patient to some risk. But feeling confident that I had the means of converting a compound fracture into a simple one, I did not hesitate to adopt the following procedure. On the 11th inst. (April 1868), the man being under the influence of chloroform, I made a curved incision behind and below the prominent end of the tibia; and, a solution of carbolic acid in about four parts of olive oil being dropped into the wound during the progress of the operation, I detached the soft parts from the bone sufficiently to enable me to insinuate behind the callus one blade of a pair of cutting pliers, smeared with the same oil, and then having placed pieces of lint, soaked with the oil, around the blades of the pliers, so as to prevent the chance of septic air entering the joint when the bone should give way, divided the callus, and at once covered the wound with the antiseptic lint. I then made a longitudinal incision over the seat of fracture in the fibula, and divided it with similar precautions. Having thus overcome the obstacle presented by the bones, I proceeded to draw the foot towards its proper position by pulleys acting upon its outer and posterior part through the medium of a skein of worsted passed round it, while a padded belt supported the opposite aspect of the leg above the ankle: the wounds being kept carefully covered with the oiled lint. When a considerable amount of force had been used there was a sudden sensation of something giving way; and now, on removing the apparatus, the foot was found to have resumed its natural place. The wounds were then dressed with layers of lint soaked with a weak oily solution of carbolic acid, and covered with the antiseptic plaster; after which, a Dupuytren's splint was applied at the inner side of the limb to prevent eversion, and Mr. Syme's horse-shoe splint anteriorly to obviate the tendency to displacement backwards. Fresh plaster has since been applied daily; and the result has been that, while the foot has retained its position satisfactorily, the patient has not suffered at all either locally or constitutionally, during the six days that have elapsed since the operation. His pulse has remained 68 or 70, he has not lost his sleep a single night, his tongue has been quite clean, and his appetite good. In fact, he has taken his food with better relish than before, because he has been freed from his previous gloomy prospect of hopeless lameness, while the operation has caused him no anxiety; as the assurance which I felt justified in giving him, that it was entirely free from danger, has been confirmed by the absence of pain or other annoyance. The discharge which was sanious and copious in the first instance, has of late been only about three minims of clear serum in twenty-four hours; and judging from our previous experience with compound fractures, there is every reason to expect that in a few days more it will cease entirely.

[The subsequent progress of the case has been, on the whole, very satisfactory. But for reasons to be soon referred to, healing by scabbing did not take place as was anticipated. The discharge instead of drying up, showed rather a disposition to increase, and assumed a somewhat puriform character; and, although the renewal of the superficial plaster once in two or three days did not involve much disturbance of the limb, I thought it best to expose the wounds when sufficient time had passed to ensure the secure coalescence of their deeper parts. Accordingly, on the 1st of May I removed the lower portions of the dressings, disclosing two superficial granulating sores, with very prominent granulations which explained the want of disposition to cicatrise. These, though treated with astringents, proved rather indolent, so

that they were not completely healed till the 4th of June, though the bones were firmly united a fortnight before.

When he was allowed to walk, though he placed the sole fairly on the ground, he experienced inconvenience from a contracted state of the sural muscles, produced by the long continued displacement of the foot backwards and consequent downward pointing of the toes, so that he could not bend the ankle beyond the right angle at which it had been maintained since the operation. I hoped that this inconvenience would be overcome by exercise; but in this I was disappointed; for though his power of walking improved, it was by no means satisfactory. It also appeared that the abnormal position of the foot had led to an exaggeration of the curve of its arch, to such an extent as to make the foot half an inch shorter than the other, while the plantar fascia was felt as a rigid band. I therefore divided that fascia and the tendo Achillis subcutaneously on the 26th of July, and this had the immediate effect of restoring the foot to its natural length, and permitting the ankle to be bent at an acute angle. Had I the case to treat over again I should perform the tenotomy at the same time as the main operation. But except the loss of time that has occurred, the result is nearly all that could be wished. Under the use of a Scarpa's shoe he has continued to improve steadily, and when I last saw him, in the early part of September, he could walk firmly and well, and complained only of some remaining stiffness of the ankle.]—*British Medical Journal, July* 18, *and Oct.* 31, 1868, *pp.* 53, 461.

46.—A SUPPOSED PSOAS ABSCESS OPENED IN MR. LISTER'S METHOD.

Case under the care of Mr. Christopher Heath, at University College Hospital.

The case was that of a young woman who was sent to the hospital to have a psoas abscess opened. She was the subject of angular curvature of the spine, and on the inner side of Scarpa's triangle there was a soft fluctuating swelling, which received a distinct impulse on coughing, and increased in tension when pressure was made between the umbilicus and Poupart's ligament. No doubt was therefore entertained about the diagnosis. The operation was performed in strict accordance with Mr. Lister's directions; the knife was dipped in carbolic acid, and after the fluid had escaped a pad of lint soaked in carbolic acid and oil was immediately applied. The contents of the tumour proved not to be purulent, but consisted of serous fluid tinged with blood. The result of the treatment by the carbolic acid was most successful, no inflammatory action being excited, and no pus formed. As the fluid is gradually accumulating again, it is proposed to repeat the tapping with the same precautions.—*Medical Times and Gazette, July* 4, 1868, *p.* 5.

ORGANS OF CIRCULATION.

47.—ON TORSION OF ARTERIES.

By Dr. G. M. Humphry, F. R. S., Surgeon to Addenbrooke's Hospital, Cambridge.

[The principle of torsion and of the ligature is the same, namely the rupture of the brittle inner and middle coats of the vessel by a force which leaves the tough outer coat unimpaired. By the ligature the coats are divided evenly and cleanly, by torsion the division is irregular, and is more properly a laceration.]

Entertaining so high an opinion of the ligature, I was long unwilling to resort to any other plan. Still, I could not be insensible to the importance of improving our treatment of wounds, and to the effect which the ligature threads and the strangulated portion of tissue included in each knot must have

in preventing immediate union of the divided surfaces. Accordingly, as I stated in a lecture a year ago, I was induced to try the plan of acupressure proposed by Sir James Simpson, and was able to report favourably of it, inasmuch as no hemorrhage occurred in any of the cases in which I used it, and the wounds did well. Still, as I then said, I hoped some better plan would be found out, for the presence of the needles in a wound, even for a short time, is objectionable; and their removal, just when a patient is beginning to recover from the effects of an operation, and is peculiarly sensitive to any impressions and apprehensive and distrustful of our intentions, I found to be a source of annoyance; and I was anxious to find some effectual means of arresting hemorrhage without the necessity of leaving any foreign body in the wound. After thinking, therefore, a good deal on the subject, and reflecting over various modes in which the end of the vessel could be temporarily sealed, I tried the plan of torsion, which has of late been used in Edinburgh and elsewhere, and have employed it now in a great many cases, including amputation in the thigh,* in the leg, and many others. Indeed, for several months I have used no other means but torsion for arresting hemorrhage; and it has answered perfectly in all the cases. There has, I think, been less pain after the operations than was experienced when we used the ligature; and the wounds have, on the whole, done better and healed more quickly. In such an operation as excision of the knee, it is especially important to prevent bleeding from the various small arteries that are divided; for unless this be carefully done, blood will collect in the wound, between and behind the bones, after the patient is in bed, will lead to suppuration, and be a source of much trouble. To prevent this evil, I sometimes found it necessary to tie several vessels; and the presence of these ligatures with the portions of tissue strangulated by them was certainly a disadvantage. In the last two cases in which I have performed this operation, I have gladly availed myself of torsion of the arteries, and have been well satisfied with the result. Still, a greater number of cases of this and other operations are necessary, to test properly the value of this mode of closing the arteries. The plan which I adopt is, as you are aware, for the smaller arteries, to use a pair of clasp-forceps, which, at the end, are rather broad, and provided with fine interlocking blunted teeth, by means of which the artery is held securely during the twisting. This I continue till the coats are quite torn through, and the forceps are thereby set free. In the case of the larger arteries, I found, by experiment on the dead body, that these forceps divided the coats of the vessel, and tore their way out too quickly; so that when I injected water into the artery by a syringe it soon, under very slight force, separated and obliterated the folds of the inner coat, which had been caused by the torsion, made its way under the outer coat, and burst through that coat. I tried other forceps of different shapes, and found that the pair of strong narrow-bladed hinge-forceps, which I show you, and which I have been in the habit of using to extract bone in operations for necrosis, answered the purpose better than any others that I have yet used. They resemble somewhat strong dressing-forceps; but the handles are large, giving good purchase, the blades meet closely, and the transverse ridges and furrows near the ends are well adapted, so that they hold the end of the artery tightly without tearing it. You see when I seize with these forceps the end of this femoral artery which I took from a subject yesterday, hold it tightly and twist it, that, although the forceps are not sufficiently broad to cover and embrace the whole diameter of the artery, yet they hold it firmly, and retain their hold till the entire end of the vessel has been twisted off. The remaining part presents a conical twisted end, which unfurls itself to some extent, but not entirely, and remains completely closed. I now throw water into it; and not till I have used considerable force do the compressed folds of the inner coat yield, separate, and permit the water to pass beneath the outer coat, which again is so sealed by the twisting, and

* Professor Humphry has used torsion to the femoral artery after amputation in the thigh in two cases. The patients were young.

so strong, though thin, that it offers considerable resistance before it gives way—a resistance much greater than would be required to withstand the pressure of the blood in the living artery. I twist other portions of artery in the same manner. They are all firmly closed. Cutting them open we find the inner coat more or less lacerated and contused, its surfaces squeezed together and thrown into folds, and held in close contact by the twisted outer coat, which forms coils, terminating in a cone or point at some distance beyond the termination of the inner coat. In some instances, I have found the inner coat detached from the outer by the squeezing that occurs during torsion, and more or less reflected into the artery so as to present its divided edge to the blood-current.

You will, from this explanation and these experiments upon portions of artery (and I have made several observations upon the dead body corresponding with these), understand what takes place when an artery is twisted. The inner thick, elastic coat is thrown into folds, which are crushed or squeezed together so as to block up the channel of the artery; it then gives way, and is torn through, and is held in its position by the outer coat, which resists longer, and undergoes still further twisting and squeezing together of its structures, so that when it is finally torn through, it retains its twisted condition, and continues to exert pressure upon and give support to the inner coat.

I have just had an opportunity of examining a popliteal artery which was twisted in a young man after amputation six weeks ago. It was perfectly closed, was contracted, and surrounded by toughish structure for some little distance. Its internal coat was wrinkled near the end, and showed some traces of ecchymosis.

You have probably observed that the attention to the blood-vessels after operations has occupied rather more time than it did when we used the ligature; and torsion has certainly, in my hands, proved somewhat more difficult than the ligature, requiring more care, more patience, and more perseverance. It is necessary to include the vessel itself in the forceps; for it is useless to twist the surrounding tissues; and it is not always easy, when blood is flowing, to make sure of the exact point from which it flows. Often, therefore, when I have been twisting, I found that my efforts were of no avail, because I had not seized the exact orifice of the vessel. Even when the vessel is seized, the inner coat is liable to slip from between the blades of the forceps, the outer coat only being retained and subjected to the torsion; and this is not to be relied on. When, however, I have been sure of having seized an artery and properly twisted it, I have not known any further bleeding to take place from it; and if it be carefully done, torsion is, I think, a valuable means of securing small and medium-sized arteries, such as the tibials, facial, &c., and by reducing the number of ligature-threads, it will be found to promote early healing of wounds. Whether it will prove to deserve our confidence in the case of the larger arteries, I am not so sure; but I should say that the doubt is founded rather upon what I have found in experimenting upon the dead subject than on what I have observed in the living; and it may be that better appliances and more experience may justify a greater reliance upon its efficiency. The experiments which I have shown you to-day upon pieces of artery, and those which some of you have seen me make upon the dead body, have proved to you that much care is needed in the selection of proper forceps, and in so seizing and holding the end of the vessel that its inner coat does not slip from between the blades during the twisting; and it will have occurred to you that in the living subject it is not easy to make sure of doing this as it should be done, or to feel certain in any instance that the artery has been properly twisted. The only rule I can lay down is to use all the care in the process, especially in grasping the orifice of the artery, and to examine well the remaining torn end after the forceps have been set free by the torsion, so as to ascertain, if possible, whether the vessel is completely closed.—*British Medical Journal, May* 23, 1868, *p.* 502.

48.—ON TORSION OF ARTERIES AS A MEANS OF ARRESTING HEMORRHAGE; WITH EXPERIMENTS.

By Thomas Bryant, Esq., Surgeon to Guy's Hospital.

[The following article is an abstract of Mr. Bryant's paper, which was read before the Royal Medical and Chirurgical Society. After some preliminary remarks, he says:]

The two methods by which torsion may be practised were described—the "free" and the "limited." In "free" torsion, the end of the artery should be fixed by a pair of clasp-forceps, and twisted freely. In "limited" torsion, the artery, having been drawn out of its sheath, should be fixed transversely about three-quarters of an inch from its divided extremity by a pair of clasp-forceps, and held steadily; whilst with a second pair of forceps the free end of the vessel should be twisted freely, as in the former kind. The object of the first pair of forceps being to fix a limit to the twisting of the vessel, and prevent the artery being separated for any distance from its vascular attachments. Three or four complete revolutions of the forceps are enough for small arteries, six or eight for large. The author then passed on to relate his experiments on animals. The first six were upon the carotid and femoral arteries of the dog. In all free torsion had been employed to both ends of the divided vessel, and in all with success. The seventh and eighth experiments were upon the carotid artery of the horse. In these limited torsion was used, and in both with success. In all these instances the animals were subsequently destroyed, and their vessels carefully examined. Special notice was then drawn to the particulars of a case in which the author had applied torsion to the brachial artery, in its upper third, of an old woman aged 68. The torsion proved quite successful, but the patient died from thoracic complications, and this allowed an opportunity of observing the changes the artery had undergone. The physiological conditions of the arteries which had been subjected to torsion then received attention; the results of every experiment were carefully described, and the different points illustrated by drawings and preparations. The results of numerous experiments upon the arteries of the dead subject, both healthy and diseased, were then given, and these went to confirm in every respect the observations obtained from the experiments made upon the living. A careful *résumé* of the physiological effects of torsion was then made. Some remarks upon the experiments then followed, and a comparison was drawn between the effects of torsion on the vessels, and the ligature, and acupressure. Some practical points connected with the application of torsion were then made, and the necessity of employing right instruments enforced. A general summary of the whole subject was then made, and the following conclusions read:—1. That hemorrhage may with certainty be arrested by torsion from even the largest vessels. 2. That it is a safe and judicious practice in all cases in which the vessels are small or of moderate calibre; and that, as far as experiments and practice yet prove, it is equally so in arteries of the first magnitude. 3. That torsion may be "free" or "limited," the free method being applicable to vessels of moderate size, and even to the largest of the extremities, limited torsion being more adapted for the large and loosely connected vessels. 4. That in torsion, as in the ligature, the permanent hæmostatic processes are alike due to the sealing of the divided inner and middle tunics; but that in the ligature there is only an irregular division of these tunics, whilst in torsion there is a complete division, separation, retraction, and valvular incurvation. 5. That in torsion the twisted cellular coat forms, with the retracted and incurved middle coat, the direct mechanical obstacle to the flow of arterial blood, in the same way as the compressed cellular coat does in the ligature, but that in torsion the twisted cellular coat and incurved middle coat become subsequently a permanent means of occluding the end of the artery, whilst the ligature of necessity becomes subsequently a source of irritation, and too often a means of undoing what has been done by nature's own hæmostatic processes.

6. That in torsion the twist in the cellular coat of an artery, the division and subsequent retraction, incurvation, and adhesion of the middle coat, and the coagulation of the blood in the vessel down to the first branch, are the three points upon which its temporary as well as permanent safety depends, whilst the permanent safety of acupressure rests only upon the last point alone, and its temporary effects upon the pressure produced by the needle. 7. That there is every reason to believe that when torsion has been successful on its first application, the fear of subsequent hemorrhage is altogether groundless, for there is nothing, as there is in the ligature, to interfere with the physiological processes set up by nature to occlude the divided vessel, and, unlike acupressure, the temporary obstacle to the flow of blood becomes a permanent one. 8. That upon physiological grounds torsion has decided advantages over the ligature and the acupressure-needle, and that if subsequent experience confirms what has been hitherto observed in the experiments on animals and the application of the practice in the human subject, we shall have gained a point of no mean importance, and simplified Surgery in no slight degree. The paper was concluded by the author stating his belief that the practice was a safe and valuable one in many cases, if not in all; that it was not a crude idea, based upon a theory spun out of a fertile imagination, for it had its origin in observation of nature's own processes; that it was based on the well-recognised physiological principles of natural hæmostatics; and that it was artificial only so far as the surgeon's art was employed in rendering these processes most available. Models, drawings, and preparations were freely used to illustrate the subject.

Mr. Christopher Heath thought it incumbent on those who had practised torsion to give their experience. He had amputated a young woman's thigh on the previous Wednesday, and had twisted the arteries, the large ones with two pairs of forceps, and the smaller with one. A tourniquet had been put on loosely as a precautionary measure, and, a little bleeding occurring four hours after the operation, it was screwed up for half an hour, and the bleeding did not return. Mr. Heath had in this case twisted off the ends of all the vessels, as he understood that practice was followed in the North.

Mr. Hulke said that Mr. Syme was in the habit of twisting off the ends of the vessels. He (Mr. Hulke) had tried the plan in cases of small vessels with success.

Mr. John Wood had in a case of amputation used torsion for the smaller vessels with little or no bleeding. He had applied a ligature to the larger one. Torsion, however, required to be used with very great care, and delayed the operation considerably. He thought that we should not come to a conclusion too quickly with respect to the effect of torsion on the arteries of animals, which were very seldom diseased. In cases of diseased arteries in the human subject, which were not uncommon, he should not trust to torsion.

Mr. Smith said that Professor Humphry considered that twisting off the ends of arteries was a *sine qua non* in torsion to arrest hemorrhage.

Mr. Spencer Wells said that, so far from it being necessary to twist off the end of a divided artery, it was not even necessary to twist at all if the vessel was not of large size. If a small artery was firmly compressed by strong forceps for the extent of about half an inch, the coats of the vessel coalesced, or were mechanically agglutinated together, bleeding being effectually stopped with less injury to the vessel than by torsion. For large vessels compression alone was less trustworthy than torsion; but it might be advantageously combined with torsion, holding the vessel about an inch above the divided end with one pair of forceps, seizing the end with another pair, and twisting the vessel up to the point of compression. In this way the danger of separating an artery from its sheath for some inches above the divided end—a danger almost necessarily incurred if a vessel be twisted six times or more without protection—is avoided. The effect of a very temporary ligature is often sufficient to prevent bleeding from small arteries. It is not necessary even to tie the knot. The silk is passed around the vessel

as if to tie it, and by merely tightening the loop firmly the inner and middle coats of the vessel may be so divided and introflexed that bleeding is completely arrested, and immediate removal of the silk is safe.—*Medical Times and Gazette, July* 18, 1868, *p.* 79.

49.—ON LIGATURE OF ARTERIES AND TREATMENT OF NECROSIS ON THE ANTISEPTIC SYSTEM.

By Joseph Lister, Esq., F. R. S., Professor of Surgery in the University of Glasgow, &c.

[It is well known that a needle or spiculum of glass will lie embedded in tissues of the body for an indefinite period provided that they do not cause irritation by their shape. If this is so, why should not a piece of soft silk ligature do the same? Because it contains within it organic germs of putrefaction. Hence it follows that if we can destroy these organic germs the ligature will produce no irritation whatever, and may be left permanently within the body.]

Ligature of the Carotid Artery in the Horse, on the Antiseptic System.—On the 12th of December last, I tied the left carotid of a horse about the middle of the neck, using fine but strong purse-silk, unwaxed, but steeped for some time in a saturated watery solution of carbolic acid. [The product of the action of carbolic acid upon blood serves the purpose of wax in preventing the first half of the knot from slipping during the tying of the second half.] The ligature having been tightly tied, so as to rupture the internal and middle coats, its ends were cut short, and the wound was freely treated with carbolic acid dissolved in forty parts of water. Seven stitches of the coarse soft wire used by veterinary surgeons for the purpose were introduced into the long wound, the most dependent part being left free for the escape of discharge. The hair around the wound was well rubbed with a solution of carbolic acid in four parts of olive oil, and cloths saturated in the same antiseptic oil were applied, over-lapping the surrounding skin freely, and retained in position by means which I need not describe; and similar oil was poured daily upon the cloths for the first six days. Ten days after the operation, I removed the dressings, and found the wound perfectly united throughout, except at the part purposely left open, which was covered with a sort of cheesy material, and as each stitch was removed, there was absence of even serous exudation. The wound was now left exposed, and in three days more the lower part had healed by scabbing, no suppuration having occurred from first to last. At the same time, there was none of the swelling and induration that usually attend the application of a ligature to a vessel in the horse's neck, and the animal showed no signs of uneasiness when the part was freely handled.

Five weeks and four days after the tying of the artery, the creature, though it had improved greatly in condition under its superior diet in the veterinary establishment, died, as the groom believed, of exhaustion from struggling ineffectually to rise from the recumbent posture. I had thus an opportunity of inspecting the parts concerned in the operation, some of which are now before you. In the first place, here is a portion of the skin containing the scar; and you will observe that it is a perfectly sound linear cicatrix, barely traceable among the hair. Here is the artery, slit up to show the condition of the interior. At the cardiac side of the place where the ligature was applied there was, as you see, an adherent coagulum, an inch and a quarter in length. But at the distal side there was no adherent clot, doubtless in consequence of the circulation through a large branch, about as big as the human vertebral, which came off, you will observe, as close to the situation of the ligature as was possible. The *cul-de-sac* formed by the distal end, though it showed indications of the puckering of the divided internal and middle coats, was completely cicatrised, the smooth lining membrane of the artery being continuous over the irregular surface. Why it was that the immediate vicinity of so large a branch did not lead to secondary hemorrhage,

was clear from the state of things beside the ligature, which lay embedded in a firm fibrous structure, with not only no pus, but no granulations, no softening of tissues around it. The portion of the external coat included in the noose, though doubtless killed by the violence with which it was pinched, had not been thrown off as a slough, but, being unstimulating, because undecomposing, it had been absorbed and reproduced by the living parts near it; while the thread had been bridged over externally by dense fibrous tissue, so that the vessel showed but little appearance of constriction where it had been tied, and it appears to be as strong at this part as at any other. You may form some estimate of its strength from the manner in which it resists the traction to which I now subject it. Here is the ligature with its short cut ends, apparently unchanged, except that it was divided in my search for it in its fibrous bed.

This case confirms the hope I ventured to express at the meeting of the British Medical Association in Dublin last autumn (see the British Medical Journal, September 21st, 1867), that the antiseptic system would free the delegation of a large artery in its continuity of the two essential elements of danger to which it is now liable, viz., an unhealthy condition of the wound, and secondary hemorrhage. Thus encouraged, I felt justified in carrying a similar practice into human surgery.

Case of Ligature of the External Iliac Artery on the Antiseptic System.—On the 29th of January of this year, I was requested by Dr. Fergus to see a lady fifty-one years of age, who was suffering from an inguinal aneurism which had existed for four years, but had of late been markedly on the increase, causing agonizing pain, which had confined her to bed for the last four weeks, and had considerably reduced her strength. The aneurism was of the size of a large orange, affecting the uppermost part of the left femoral artery, and extending a little above Poupart's ligament. Any delay appearing undesirable, I tied the external iliac on the following day, in presence of Dr. Fergus, and assisted by Messrs. Hector Cameron, Appleton, and James Coats. There was nothing peculiar in the operation, except that the incision was made a little further outward than usual, in order to avoid the upper part of the aneurism. The only bleeding vessel that required attention was twisted. The ligature employed had been previously steeped for two hours in strong fluid carbolic acid, prepared by adding a small proportion of water to the crystals. The tightly twisted thread requires a considerable period of immersion to ensure thorough soaking with the liquid; and the acid does not impair the tenacity of the fibre. At the time of the operation, the superfluous acid was removed by transferring the silk to a solution of carbolic acid in thirty parts of water; and the same lotion was used for the sponges, and also for washing the aneurism-needle before it was passed round the vessel. The artery having been tied, and the ends of the ligature cut short, the wound was freely treated with the watery solution, some of which was poured in, to make sure that it penetrated to every part. The edges of the skin were then brought together with silver sutures, except in the middle, where I introduced a pledget of lint steeped in a solution of the acid in five parts of olive oil; passing it deeply, but leaving one end projecting externally, to serve as a drain for blood and serum. I then applied an external antiseptic dressing, the details of which I need not now describe. The pledget of lint was cautiously withdrawn on the following day, under cover of a pretty large piece of lint imbued with the antiseptic oil; and the external dressing was reapplied, and afterwards changed at intervals proportioned to the diminution of the serous discharge, which, at the end of a fortnight, was estimated at about three minims in three days. At this time, some portions of lint, which had been left till then undisturbed, were removed, when the wound was found quite free from pus, being perfectly cicatrised where the sutures were introduced; while the central part, where the pledget was placed after the operation, presented the appearance of a superficial sore, but not a granulating one; for the deep surface of the dressing, being devoid of stimulating properties, had failed to induce granulation in the tissues on which it lay. Meanwhile the patient had been relieved from the pain which she pre-

viously suffered, without experiencing febrile disturbance or any material inconvenience from the operation, except uneasiness in the wound the first two days, during retching occasioned by the chloroform. The tongue had been natural throughout; the pulse had only on one day been as high as 90, 72 to 84 being the usual rates; and her appetite, which had been absent during the four weeks of agony that had preceded the operation, returned two days after it, as soon as the derangement of the stomach from chloroform subsided. On the fourteenth day, as I was arranging her pillows, she sat upright without inconvenience. Four weeks after the operation, the wound being completely cicatrised, she was allowed to move about in her room; and, just six weeks from the date of the ligature of the artery, she descended three long flights of stairs, walked for some time in the streets, and reascended the steps to her lodgings; and, though fatigued by the effort, she felt next day all the better for it. On March 31st, she called to see me, much improved in strength, though with still some tendency to swelling of the legs, especially the left, when in the erect posture. The aneurismal swelling felt merely like a slight glandular thickening. [On July 25th, 1868, I again visited her. She had derived much benefit from a stay at the seaside, and the tendency to œdema of the extremities was greatly diminished. There was still absence of pulsation in the external iliac artery, and the cicatrix remained quite sound twenty-five weeks after the operation; so that, whatever may have become of the ligature, there need be no apprehension of its ever making its appearance externally.]

The success of these cases of ligature depends, as we have seen, upon the circumstance that not only a neutral foreign body, but a portion of dead tissue, if simply protected from putrefaction, is entirely devoid of irritating properties. A good example of this fact is presented by a case at present under my care.

Case of Acute Necrosis treated on the Antiseptic System.—The patient is a boy, eight years of age, who was admitted into the infirmary on Jan. 25th, 1868, having, five days previously, received a violent blow upon the left leg with a heavy pair of tongs, resulting in intense inflammation in the limb, which was red and swollen from the knee to the ankle. Fluctuation being distinctly perceptible over the upper part of the tibia, the matter was evacuated antiseptically. A piece of lint dipped in an oily solution of carbolic acid having been laid upon the part where the incision was to be made, its lower edge was raised to allow a knife smeared with the same solution to be plunged into the cavity of the abscess, when the curtain was at once dropped so that the pus might flow out beneath it. When all the matter had been pressed out, an external antiseptic dressing was applied, and this was afterwards changed daily. Four other abscesses afterwards made their appearance at intervals down the limb. These were treated in the same way; and in every case when a probe, carefully guarded by being passed among folds of lint steeped in the antiseptic oil, was introduced into the incision, it came into contact with bare bone. This was of itself sufficient evidence that portions of the tibia, of greater or less thickness, were dead; for, had the periosteum been raised by suppuration from living bone, the osseous surface would have become covered with granulations during the process. But evidence which must satisfy the most incredulous is afforded by the fact that, between two and three weeks after the first abscess was opened, a probe introduced into the orifice still passed down to bare bone. Under such circumstances, what, it may be asked, could be the advantage of continuing the antiseptic dressing? If dead bone was present, whether in larger or smaller amount, must it not become detached from the living osseous tissue by a gradual process of exfoliation, which an antiseptic applied to the skin could neither promote nor hinder? Such may be a natural inquiry. But having seen a large mass of dead bone absorbed before my eyes by the granulations that enveloped it, in a case of compound fracture treated antiseptically (see Lancet, March 23rd, 1867); and having also had evidence from *post mortem* examination in a case of hip-joint disease where extensive necrosis existed in connection with caries, that bone killed by inflammation might, under antiseptic management,

fail to induce suppuration; putting those facts together, I thought it not unlikely that, in the case we are considering, the dead portions of the tibia would be absorbed by the living tissues around them, if we perseveringly maintained an effectual external antiseptic guard. Such, then, was the practice we pursued, and the result was such as I had anticipated. The various incisions successively healed, till by the 6th of this month (April), eleven weeks after the receipt of the injury which caused the attack, the abscess last opened was soundly closed and cicatrised, not a particle of dead bone having come away from any of the openings. At the same time, the swelling of the limb, instead of increasing, as is the case under ordinary treatment, from formation of new bone in the periosteum under the stimulating influence of exfoliations soaked with putrid liquids, had disappeared almost entirely from the upper part of the leg, which was that primarily affected, and was rapidly diminishing elsewhere. [On the 18th of May, the boy left the hospital with the full use of the limb. I had intended giving him a somewhat longer rest in bed as a measure of precaution. But I found that for a considerable time it had been impossible to keep him from getting up and running about the ward; and he was none the worse for his activity.] This certainly was very different from the tedious course of such cases under ordinary treatment.

With regard to the manner in which the dead bone has been disposed of, some who have not witnessed similar occurrences may doubt the possibility of its absorption, and believe that the necrosed pieces are still lying unchanged in the interior of the leg. But even those who take such a view must admit that we have here a most striking illustration of the important truth, that dead tissue, if protected from putrefaction, is of itself incapable of exerting any disturbing influence upon surrounding parts.—*British Med. Journal, Aug.* 1, 1868, *p.* 101.

50.—ON THE ANTISEPTIC LIGATURE OF ARTERIES.

By C. F. Maunder, Esq., Surgeon to the London Hospital.

The ligature of the larger arteries is an operation of great interest to the surgeon, and of vital consequence to a patient. The operation is often of necessity undertaken under circumstances of unusual risk, and it is especially here that all aids to a successful issue should be imported into the treatment.

I hasten, therefore, to record the fact that less than five weeks ago I ligatured the left common carotid artery, on the antiseptic principle, in a man, twenty-six years of age, and the subject of three surgical aneurisms. The vessel was secured on the plan recommended by Professor Lister, the ligature having been soaked in carbolic acid, cut short, and the wound closed, &c. Scarcely any action was set up about the wound, and in less than a month from the deligation (as I am informed by the patient's medical attendant, who watched the case very closely) the wound had healed, the silk thread did not come away, and he has gone to the seaside. On a former occasion, having ligatured the subclavian and common carotid arteries in the usual way, I mopped out the incisions with carbolic oil, and covered them in with carbolic dressings. Up to the sixth day, when the subject of this double ligature died, almost no action had been set up in the wounds. I quite believe the antiseptic ligature of arteries will greatly diminish the risk of secondary hemorrhage.—*Lancet, Nov.* 7, 1868, *p.* 596.

51.—A SUBSTITUTE FOR THE LIGATURE.

By Dr. N. R. Smith, Professor of Surgery in the University of Baltimore.

I have recently devised a little apparatus as a substitute for the ligature and acupressure in the deligation of arteries. It consists of a small silver

tube, and a fine annealed iron wire passed double through the tube and projecting a loop at one extremity. The tube has a small double slit at one end. In applying it, the loop of wire is laid over the bleeding artery; the vessel is then seized with the forceps or tenaculum, and raised. The operator now, holding the tube with his fingers or forceps, seizes the free ends of the wire, and draws them steadily but firmly till the artery is tightly seized by the wire-loop. He now bends the double wire down into the fissure in the margin of the tube, and then gives it one turn around the end of the tube. Then he clips with the scissors the ends of the wire, leaving length enough to be seized by the fingers in removing it.

When the ligature has accomplished its purpose, it is to be removed by seizing the tube with forceps, unwinding the wires, disengaging them from the slit, and then seizing them with pliers and steadily drawing the wire-loop through the canal of the tube, thus severing the artery as by a small *écraseur*.

It may be removed from arteries of the fourth or fifth magnitude in six hours with safety. I have removed it from the femoral artery, after amputation of the thigh, on the second day. In a case in which I applied the apparatus to two arteries, after amputation of the breast, I found them disengaged on the second day, and on touching them they slipped away without the slightest resistance.

The tube is of silver, the wire of iron. Thus there is established (with the artery) a small galvanic circle, which promotes the prompt and firm coagulation of the blood in the artery, and the disengagement of the wire. This I regard as a circumstance of great importance in the *modus* of its action. I should remark that the tube can also be removed by simply twisting it with the thumb and finger. The tube should be of length sufficient to project half an inch or so from the lips of the closed wound.

This apparatus is applied with much more ease than a ligature, as there are no knots to tie, nor any necessity for the assistant to carry his hand around the forceps, which is often disengaged thereby.

Why should not this supersede acupressure? It possesses all its advantages, and does not involve the necessity for wounding the parts anew. I have not yet tried it in the treatment of aneurism, but shall do so on the first occasion. It will be necessary then to carry the wire around the artery, and then to pass the two ends through the tube. The galvanic influence will here be very important in promoting the formation of a firm coagulum.—*British Medical Journal, March* 14, 1868, *p.* 241.

52.—ON THE TREATMENT OF ANEURISM BY IODIDE OF POTASSIUM.

By Dr. George W. Balfour, Physician to the Royal Infirmary, Edinburgh.

Case 1.—*Aneurism of the Aorta.*—Peter Rice, a mason, aged 39, admitted into Ward III. on the 29th April, 1867. Patient has never had rheumatic fever, but for the last five years he has been subject to rheumatic pains in his hip, leg, and back, which are generally severe, and are most apt to recur in the changeable weather of spring. He has been in the habit of drinking pretty freely. About twelve months before admission, he fancied that he was overwrought, and when he got home, he found that he could not take a deep inspiration freely; he also felt a sharp pain at a point about two inches to the right, and a little above the left nipple. This pain has continued ever since, and has latterly increased considerably. This pain is stationary at the part described, but when more severe than usual, it spreads upwards to the armpit and shoulder, and down the left arm to the wrist, occasionally extending downwards to the scrobiculus cordis, and sometimes striking sharply through to a corresponding point at his back. It is specially apt to be severe at night, preventing him from sleeping, and is very annoying when it affects his back, as he cannot lie in any other position than supine. He has occa-

sional fits of dyspnœa, and it is always painful for him to take a full inspiration. He has also some difficulty of swallowing. He is much troubled with palpitation, and a distressing feeling of pulsation, and these sensations annoy him most when the pain is severe. At such times, he obtains some relief by relaxing the respiratory muscles, by stooping forwards and leaning against a wall or other support, with his hands and arms extended. About a week ago, his symptoms had increased so much that he was obliged to cease working altogether. His appetite is good; his bowels generally confined. On percussion, the heart seems of normal size; its pulsations are distinct, and in their ordinary situation; the first sound is normal, the second accentuated. The right radial pulse is fuller than the left. About three years ago, the patient had muscæ volitantes, lasting off and on for about two years, appearing only for a few seconds each time; and still at times, he cannot see things at a distance so well as he thinks he ought, the letters seeming to swim before him when reading. His left pupil is slightly dilated. Some time ago, he also had tinnitus aurium. His left cheek is often flushed, and at times he feels it warmer than the other. His lung-sounds are normal, but he has an imperfect, hard, clinking cough, without expectoration. He also frequently perspires without any apparent cause. There is a slight bulging of the walls of the chest, between the second and third ribs, at the left edge of the sternum, extending into the *manubrium sterni*, and gradually declining all around within an area covered by that of the mouth of a tumbler. Over this space, and for a corresponding distance downwards towards the heart, there is dulness on percussion, and a distinct sense of liquid pulsation. Within this region, the heart-sounds are also extremely distinct, but there is no bruit.

Twenty grains of iodide of potassium were ordered to be given three times a day, and a belladonna and opium plaster was applied over the tumour. About a month after, on the 23d of May, as the patient fancied he was not improving, the iodide was omitted, and a precisely similar dose of the bromide of potassium was substituted for it. At first, the patient fancied the change of remedy had done him good, for he had less pain, and got more sleep; but this improvement was apparently of short duration, even though the dose of the bromide was subsequently increased to thirty grains thrice a day, for on the 7th of June the iodide was again recurred to in doses of twenty grains thrice a day, with the addition of one-twelfth of a grain of iodine in each dose. On the 7th of June, it is stated that "there is more pain over the aneurism, and he feels his left hand benumbed. The swelling seems to have increased in size since the 15th inst." On the 17th of July, however, it is entered that he "states that the pain in his breast and down his arm are not nearly so bad as they used to be, so long as he is quiet in bed; but when he rises and walks about, they become even worse than before." The patient continued to wear the belladonna plaster, but on the 7th of July the iodide was omitted, probably on account of coryza, which, though not recorded, the patient has told us that he suffered from about this time; and on the 8th the following pills were prescribed:—

℞. Extr. aloës aquosi, gr. i.; extr. colchici acetic, gr. i.; mass. pil. hydrarg. subchlor., gr. ij. Misce fiat pil. mitte tales xii., sgr. one night and morning.

There is no further record in the books of Ward III. as to the iodide being again resumed, and I am not aware whether it was or not; I believe, however, that it was. The last entry is on July 18th.—"Thinks himself easier to-day."

On the 1st of August, the patient was transferred to Ward VII., and placed under my care. He was at once placed upon thirty-grain doses of the iodide of potassium three times a day, and these doses he has continued to take without intermission up to the present time (May 1868), with continually increasing benefit, and without the production at any time of the slightest unpleasant symptom. For several months, he also continued to wear a simple belladonna plaster over the tumour, but at last it blistered him, and produced so much eczematous eruption each time it was attempted to re-apply it, that it had to be discontinued. On coming under my charge, he was strictly con-

fined to bed, and for long he lay entirely on his back, that being the only position in which he found always comparative and, latterly, perfect ease. He was only allowed to get up and move about for the first time about three weeks before his dismission on the 2d of April. He was placed upon fish diet at first,—meat being subsequently given when he tired of the fish, but he was at all times carefully warned of the necessity for strict moderation both in eating and drinking; water, small quantities of tea, and milk for supper, being the fluids supplied. With all this care, and notwithstanding the large doses of the iodide administered, his progress at first was extremely slow, but it was steady; and in a clinical lecture given on his case on the 19th of November last, I find it stated "there is no longer any tumour visible, and it is only on careful examination that you will discover any pulsation; he is so far recovered, that he is a little inclined to be rash, and to move about quickly in bed, or even to turn upon his side; but upon this the pulsation instantly returns—a sufficient warning to him that he is not yet cured." Indeed, it was not till the beginning of March, in this year, that he was able to move about freely, without discomfort or any return of the pain or pulsation. On the 1st of April, I had the honour of exhibiting this patient before this Society, just previous to his discharge from hospital, when you had the opportunity of observing the complete subsidence of the tumour described, pulsation being only to be obscurely felt in the situation where it formerly existed; you also heard the man's statement that his pain, dyspnœa and dysphagia, were gone; and you were able, from his healthy and energetic appearance, to form some idea of the importance and value of this mode of treatment. I may add, that I have repeatedly seen this patient since his discharge, and that he still continues to improve, while, from the active manner in which he marches through the streets, no one would suppose that but a year ago he was what might well be thought a hopeless invalid, afflicted with one of the most terrible and incurable of maladies. With all this improvement, however, Rice is not cured; it is doubtful indeed, whether, under his circumstances, a poor man necessitated to do something for his daily bread, he ever can be cured. But he has obtained great and incalculable relief, and his case is an encouragement to us in the treatment of similar affections, and full of hope for those who, placed in happier circumstances, may yet labour under a similar disease.

[Several other cases are related all illustrating the same thing. The following extracts from the subsequent part of the article are interesting.]

About ten years ago, a Pole presented himself to M. Nelaton, with a tumour in the lower part of the neck, which had been recognised by MM. Bouillaud, Andral, and Beau as an aneurism of the innominate implicating the aorta. He stated that while in Warsaw, his sufferings had been much relieved by the use of the iodide of potassium. M. Nelaton took the hint, and continued the remedy, the result being—to his great surprise—a notable amelioration of all the symptoms, with almost complete disappearance of the tumour, so that the Pole returned home in a satisfactory state of health.

On commencing hospital duty in August 1860, Dr. Chuckerbutty, of Calcutta, found in the wards an Irishman, aged 50, afflicted with a harassing cough, accompanied by profuse expectoration, which remained unrelieved by any treatment until a solution of iodide of potassium, in decoction of cinchona, was employed. Coincident with the relief to the cough thus obtained, Dr. Chuckerbutty was astonished to find that an aneurism of the innominate, from which this man also suffered, became gradually solidified.

Of fifteen cases of aneurism which, so far as I know, comprise all the cases of this disease already published, in which the treatment by iodide of potassium has been persistently carried out, there has been in all save one—and that a perfectly hopeless case—a marked relief to the suffering; in twelve there has been undoubted diminution in the size of the sac, while in a few, the number of which a longer continuance of the treatment has ere now probably increased, there has been so complete a subsidence of the tumour and relief of all the symptoms as to amount to an apparently perfect cure.

These results are extremely encouraging; and when we reflect upon the entire absence of any risk to the patient from the treatment, and the almost absolute certainty of relief to his sufferings being at least attained, I think we are warranted in saying that no treatment for aneurism, and especially for internal aneurism, hitherto devised holds out anything like an equal prospect of relief, if not of cure, with that by the iodide of potassium.

To attain these objects fully, several circumstances must be carefully attended to, and the first of these is the dose of the remedy to be administered. In the cases related, the dose has varied from five grains to thirty, three times a day. In one case, ten grains thrice a day produced violent salivation, which ceased on a reduction of the dose to five grains; in another, twenty grains thrice a day seemed to produce violent diarrhœa, which also ceased on a reduction of the dose to five grains. In one of my own cases, considerable coryza was produced at first, while the patient was taking only twenty grains thrice a day; but this rapidly ceased upon intermitting the remedy, and did not subsequently recur, though the dose was afterwards increased to thirty grains thrice a day, and continued many months. In my other two cases, thirty grains twice a day were administered, without any ill effects from the first; in one of them, however, pain in the stomach or head occasionally supervened, but was at once relieved by intermitting the remedy for a few days. Now, whether the action of this remedy consists in altering chemically the constituents of the blood, or in influencing in some unknown manner the vitality of the blood, or of the organs in which it circulates, it seems probable that it is in some measure proportionate to the quantity ingested, because the relief of pain, which is one of the earliest symptoms of amendment, is not produced till a certain efficient dose has been given. It seems therefore of consequence to attain that efficient dose as rapidly as possible, and whether it be that a large dose more readily establishes a tolerance of this remedy or not, there is certainly no evidence as yet before us to prove that this drug can be more safely administered by beginning with small doses, and gradually increasing them, than by commencing with full doses, as of thirty grains at once, intermitting them occasionally for a day or two on the occurrence of any symptoms which seem to call for this. In attempting to produce the specific action of iodide of potassium, saturation of the blood seems to be imperatively required by the rapidity with which the secreting organs, and especially the kidneys, remove it from the system—twenty-four to seventy-two hours' abstinence from the drug having always sufficed to cause the disappearance of every trace of its presence from the urine. While the continuous administration of large doses may possibly in time succeed in saturating not only the blood, but even the tissues, at all events some such effect seemed to have been produced in Case 1, in whom, in the latter months of his treatment, the application of a belladonna plaster was always followed by vesication and an eczematous eruption, although he had previously worn such plasters for many months without any ill effects, and it was only after this thorough saturation was attained that this patient's improvement progressed with any rapidity. From the apparent importance of this element of saturation, and the safety with which it can be produced in most cases, its attainment being evidently not necessarily connected with the development of any unpleasant symptoms, which occasionally then cease to appear, though they have been present at an earlier stage of the treatment, the proper procedure in all cases in which unpleasant symptoms arise, would seem to be not diminution of the dose, but temporary intermission of the drug, and possibly, in some instances, its combination with some counteracting agent, such as opium. And I make this suggestion the more readily because, though large doses of this drug have unquestionably a greater tendency to irritate the gastro-intestinal mucous membrane—an irritation which may be checked by intermitting the drug, or altering its mode of administration—other unpleasant symptoms, such as coryza, etc., do not seem to be necessarily connected with largeness of the dose, but seem referrible more to idiosyncracy than to poisonous action. The only severe case of coryza which I have seen produced in this manner has been apparently due to the trifling

amount of the iodide contained as an impurity in a few drachms of the bromide of potassium—the bromide itself, I believe, producing no such effect.

As to the length of time during which this treatment ought to be continued, we have as yet no means of judging. Many of the cases I have quoted seem to point to a few weeks as sufficient to establish a curative result, but this has not been my experience. A certain amount of relief may no doubt be rapidly attained, but any considerable amendment has only been procured after keeping the patient for many months persistently saturated with the drug; and I should not consider that this treatment had a fair trial, unless it had been carefully carried out for at least twelve months, while it is probable that the full benefit is not to be derived, in many cases at least, except by a steady persistence in its use for several years. But this treatment is of too recent introduction to say anything positive on this head.

In regard to the adjuvant treatment, there are one or two remarks to make which seem to me of considerable importance, and these may be comprised under the two heads of position and diet. Whatever is capable of lessening the frequency of the heart's action, without impairing the strength of the patient, or vitiating the quality of his blood, cannot be an unimportant adjuvant in the treatment of aneurism. The enforcement of the recumbent position, therefore, which is so influential in this respect, has seemed to me a matter of paramount necessity, and has been strictly carried out in all my three cases; indeed, in the most serious one (Case 1), the patient was laid upon his back for fully seven of the eight months he was in my ward, not being permitted even to turn upon his side--any attempt to do so being always attended by a recurrence to some extent of the pain, along with an uncomfortable sensation of pulsation. I have no doubt that the success attained in his case is very considerably due to the long-continued perfect rest in the recumbent position; and in the treatment of so serious a disease as internal aneurism, I should consider it most unwise to neglect the employment of this simple but efficient mode of aiding the cure. No doubt the enforcement of this portion of the treatment is irksome and impossible of attainment without the intelligent acquiescence of the patient, but I have not had any difficulty in obtaining this, on explaining my reasons, and the object I had in view; and I may make the same remark as to diet. Aware of the evils of starvation on the one hand, and of plethora on the other, my patients were put upon a somewhat restricted mixed diet—fish being given for dinner, at first at all events, as being the least nutritious form of animal food, while they were told voluntarily to restrain their appetite as much as possible, and to make use of no more than what they felt to be sufficient to maintain themselves. In regard to fluids, water, tea, or milk alone were allowed; and though they were not doled out in a measured quantity, yet similar directions were given in regard to them as in regard to solid food; explanations were given in regard to the result desired, and the evils to be avoided, and careful inquiries were daily made as to the mode in which these advices were being complied with, so as to impress their necessity and importance upon the patients. I have had no reason to be dissatisfied with the result of this reciprocal confidence between patient and physician, and I believe it to be more conducive to the well-being and the comfort of the former, than any more precise definition of amounts by weights and measures. The principles of the treatment were intelligibly laid down, and intelligently acted upon, and the effects daily noted, and the result has been that all of my patients have, without becoming plethoric, yet preserved a healthy and well-nourished appearance throughout the whole of their tedious treatment.

In regard to the mode of action of the iodide of potassium, I have already mentioned that Dr. Chuckerbutty supposes it to increase the coagulability of the blood, and that Dr. Roberts seems to consider this a probable theory. The correctness of this idea is, however, doubtful; it might explain the coagulations of the blood in the aneurismal sac, but it could not explain the great relief to the pain, which is the almost immediate result of the ingestion of an efficient dose. Moreover, large doses of iodide of potassium relieve the pain of many cases of rheumatism, and the distressing spasm of asthma; in

the latter disease, indeed, far larger doses have been given than that I have recommended—Dr. Aubrée having successfully treated several cases with doses of forty-five grains three times a day; these are diseases in which increased coagulability of the blood is not likely to be beneficial, yet the relief to suffering in all these cases is very marked, and, at all events, as regards rheumatism and aneurism, very similar in character. So far as I know, no one has hitherto attributed to the iodide of potassium sedative properties similar to those known to be possessed by the bromide; yet it is possible that it may act as a sedative to the nervous system, modifying its action in some unknown manner, and it is probable that its curative action in all these cases is due to this peculiar modification of nervous action—the coagulation of the blood in the aneurismal sac being the result of secondary causes. In Case 2, this treatment produced an immediate and remarkable effect in lessening the fulness and force of the pulsations, not only in the tumour, but throughout the whole arterial system, and this not to our observation alone, but also as perceived by the man himself. This sedative action, which must have been exerted primarily on the nervous system, must no doubt favour greatly the coagulation of blood in an aneurismal sac; though not observed, it may have existed in the other cases, and it gives the only rational explanation of the peculiar effects of the iodide according to our present knowledge. I regret that in none of my cases was the sphygmograph employed to record the force of the arterial pulsations; and thus to detect any deviations produced by treatment; in any subsequent cases that may come under my care, I shall endeavour to do this so as to settle this matter.

I need hardly say that, notwithstanding the great and manifest relief obtained in almost all cases of aneurism by this treatment, positive cures can only be exceptional, of comparatively rare occurrence, and the result of long-continued and careful treatment. An aneurism may prove fatal in so many various ways besides rupture, that the mere coagulation of the blood within the sac is a comparatively small step towards a complete cure, though by no means an unimportant one. The relief obtained can only be regarded as unequivocally tending towards a cure, when, from the symptoms, it is apparent that the aneurism is not only becoming more solid, but also shrinking in all its dimensions; and even then incautious exertion may rupture the sac at some point where fluid blood may still communicate with the arterial canal, and death may thus ensue while the patient is flattering himself that he is being cured. Compression of important organs by the solidified sac may also induce dangerous and even fatal complications. And even under the most favourable circumstances, the occurrence of aneurism of a large and important artery proves the existence of such a diseased condition of the arterial coats as will render the patient's life ever after a precarious one.

Notwithstanding the great relief to the symptoms in almost every case, it is obvious that anything beyond this—anything at all approaching to a cure—can only be expected in sacculated aneurisms, and chiefly in comparatively young individuals, and in cases more or less of a traumatic character, that is, produced by unusual exertion, as evincing a possibly less seriously diseased condition of the arterial coats than where the aneurism has occurred more gradually, and, as it were, spontaneously. On the other hand, when the aneurism has been of slow and spontaneous growth, these very circumstances, evincing as they do the existence of a greatly diseased condition of the arterial coats, would form unfavourable elements in estimating the probability or completeness of a cure; and the presence of more than one aneurism in the same person would seem likely to reduce still further the chances of anything beyond mere temporary improvement; but as the history of Case 3 shows, even in such cases this improvement may be so great as to be well worth all the trouble expended in attaining it.—*Edinburgh Medical Journal, July*, 1868. *p* 33.

53.—POPLITEAL ANEURISM: CURE BY PRESSURE IN TWENTY-EIGHT HOURS.

Case under the care of Sir Henry Thompson, at University College Hospital.

[The patient was a labourer, 59 years of age, and his symptoms had existed about seven weeks prior to admission.]

On admission there was an oval tumour, about the size of a small orange, in the popliteal space, painless, smooth, non-adherent to the skin, and distinctly circumscribed. It was situated immediately over the aspect of flexion, and extended rather more below than above the head of the tibia. There was a distensible eccentric impulse synchronous with the heart's systole, ceasing when the femoral was compressed, and refilling again with a bound when the pressure was removed. Pulsation was perceptible in the anterior peroneal artery. In the anterior, but not posterior, tibial artery, a blowing, but not very loud murmur, was audible on auscultation. The cutaneous veins were enlarged over the tumour. The circumference of the affected limb was five-eighths of an inch in excess of its fellow.

As the tumour was small, it was thought expedient first to adopt the treatment by flexion. Accordingly, on the following day, the limb was bandaged, gently flexed upon the thigh, and retained in that position by additional bandages. The flexion caused no pain. The limb was kept in this position four days, until two p. m. on the 21st, by which time no difference in the pulsation was perceptible. Mr. Ernest Hart saw the case, and flexed it more completely. The limb, however, was set free on the 23rd, as the knee had become swollen and painful. On the following morning, at 11 o'clock, the leg having been previously bandaged with stocking elastic, a Carte's compressor was applied over the femoral artery just opposite Poupart's ligament, and another was applied about four or five inches lower down. The patient himself, a very intelligent man, changed the compressor about every three-quarters of an hour, and felt little discomfort from its application. *By half-past three on the following day, twenty-eight hours after the first application of the compressor, all pulsation in the tumour had ceased.*

The patient from this time had no bad symptoms; he slept and took his food well. The compressors, which had been kept on at half pressure since the pulsation ceased, were loosened altogether on the 28th, although not taken off the limb; and the bandages partly undone. He was able gradually to straighten his leg. The tumour gradually diminished, and left merely a small hard tumour. He got up for the first time on May 9th, but was unable to put his foot to the ground; and slight œdema resulted on the following day, which, however, gradually diminished. He was speedily able to walk, at first with the assistance of crutches; and left the hospital on the 8th, perfectly well.—*British Medical Journal, July* 4, 1868, *p.* 7.

ALIMENTARY CANAL.

54.—A CASE OF STRICTURE OF THE ŒSOPHAGUS AFTER SWALLOWING CAUSTIC POTASH.

By Jonathan Hutchinson, Esq.

[Mrs. O.— swallowed by accident some caustic potash, and although she recovered easily from the first effects, the symptoms of a contracting stricture of the œsophagus were steadily developed. She was attended by Mr. Mead, of South Hackney, with whom Mr. Hutchinson saw the case for the first time on September 6th, 1866.]

On the next day Mr. Mead, Mr. Ross, and I met, and having put Mrs. O. fully under the influence of chloroform, in the sitting posture, I made a long trial of bougies of various sizes. I could pass the upper stricture easily

with the largest, but I could not get even a No. 8 catheter through the lower one. The catheter (an ordinary urethral one) came against the stricture when it was passed its whole length, so that the handle was level with her teeth. I could not even get the end of the catheter into the stricture, so as to find it gripped.

The failure of this trial, made with every advantage, was very discouraging. As the testimony of herself, her husband, her son, and her surgeon was unanimous, and to the effect that she was rapidly losing ground, as she had almost literally swallowed nothing for a week, I came to the decision that it was not a case in which delay was proper, and advised that an opening into the stomach should at once be made. In arriving at this conclusion, I was much influenced by the knowledge that in these cases the stage of fatal collapse sometimes comes on suddenly, and that all who have performed the operation have left the caution to their successors, not to delay the measure until the patient has become too ill to have a chance of surviving it. Our patient seemed to be a most suitable subject for it. She was very thin, and the stomach was tympanitic, and would probably be easily found. She was very anxious for relief, and had remarkably good control over her feelings. Having fully explained to her husband the kind of advantage to be hoped from the operation, and the risks which attended it, he eagerly urged us to do what we thought the best. Arrangements were accordingly made for the performance of the operation at 3 o'clock the next day. I intended not to give chloroform, to introduce a large *silver* tube into the wound and retain it, closing the surrounding parts very carefully, and in the after-treatment to keep ice bladders on the abdomen. For the first few days I proposed still to continue feeding by the rectum, and if practicable to avoid disturbing the stomach by introducing food prematurely into its cavity.

On the following day, however, our patient was so much better that it was decided to defer the operation. She had swallowed a little milk and beef tea very soon after our trial of the bougie.

During the next week Mrs. O. continued to improve in capacity for swallowing, and took daily fair quantities of fluid. She gained strength, slept fairly, and was in good spirits.

We did not use the bougie again for ten days, when, as she had more difficulty, another attempt was made. I had had a *conical* bougie constructed, hollow through its upper two-thirds, so as to permit of the introduction of a steel stillette, thus allowing the end to remain flexible, and enabling me to stiffen and give force to the stem. In practice, however, I found the bougie long enough and stiff enough. Introducing my fingers well into the mouth, so as to press straight downwards, I was able to get the end of the bougie (a No. 6 urethral) well into the stricture, but not through it. During the week following she took food fairly, and on September 28 she was decidedly in improved condition.

After this date it was not necessary for me to see her. She remained under Mr. Mead's care, and, without any further use of bougies, steadily advanced. Her husband frequently called on me to report, and his statement always was that she took fluid nutriment better and better.

At the present time (a year later) Mrs. O. is in better health than she has been for years. She still suffers from stricture, and can only swallow solids when carefully minced. She is more than a stone lighter than she formerly was, but has wholly lost certain dyspeptic and nervous symptoms, which, before her accident, used to trouble her much. She is able to go about all her usual duties. Should the stricture ever show tendency to contract she is prepared to submit to bougie treatment, but for the present is content with her condition.

I trust it has been made clear to the reader that Mrs. O. had a very narrow escape of a very dangerous operation. Yet, notwithstanding the satisfaction which I feel in the fact that we did not perform it, I must contend that its recommendation was fully warranted by the prevailing rules of surgery. If ever there was a case for gastrotomy, this was one. The stricture was not malignant; if, therefore, the patient survived the operation, she might be

expected to enjoy an indefinite prolongation of life. The bougie had been carefully tried by several hands and had failed. She was getting daily weaker. I had employed chloroform, and made a very prolonged attempt to get the bougie through the stricture without success.

The case has made such an impression on my own mind, that I cannot conceive any circumstances which could in the future induce me to abandon the bougie and resort to gastrotomy. It is clear that these cases are never hopeless, and that it is quite possible that just when the last stage appears imminent, a change for the better may ensue. It is clear also, that a tight cicatricial stricture, once dilated a little, may remain for long after without giving further annoyance. My remark as to the unjustifiability of operative interference refers especially to cicatricial strictures. In these the one object is to preserve life, whilst in some others, there may be also the secondary one of mitigating suffering, and this, too, even to some extent regardless of the result to life.

Let the advocates of opening the stomach produce one case with results after the operation as good as those which I have recorded above. Against that one case, when it is produced, I shall ask leave to set the numbers who have died directly in consequence of such operations, and still further to suggest that, even in that one, the result might very possibly have been as good without it. The dilemma in which the advocates of gastrotomy are placed is this—the operation is confessedly so dangerous, that it is not justifiable till the case is otherwise hopeless, whilst facts prove that it is not possible to make such a prognosis without risk of error. It appears to me that there are several other surgical procedures which stand with it in a similar position:—Opening the abdominal cavity to search for a cause of intestinal obstruction; trephining the vertebræ for fracture of the spine; ligature of the innominate or inner third of subclavian artery; the distal ligature of large vessels; and some others, are such dangerous methods of treatment, that they cannot be resorted to excepting in the supposed inefficiency of all other means. Yet the cases for which they are proposed are never actually hopeless, and every now and then, in those apparently most so, recovery will ensue. We have, for instance, in the London Hospital Museum, a splendid specimen of cured aneurism of the innominate, the cure having been by a modified Valsalva's method, without operation. Let the advocates of distal ligature show such another. Respecting all the operations I have mentioned, I may express my firm conviction that the surgeon who resolutely declines to perform them will in the long run do more for the lengthening of his patients' lives than he who, although with the utmost acumen of diagnosis and skill in operating, permits himself to resort to them. There are other means of treatment, less brilliant but more hopeful.—*Clinical Lectures and Reports of the London Hospital*, 1867-8, *p.* 56.

55.—THE RADICAL CURE OF HERNIA.

By Dr. J. Fayrer, F. R. S. E.

[Dr. Fayrer states that his plan of treating hernia radically is a modification of Professor Syme's method, and is valuable on account of its simplicity. The instruments required are a plug of wood, with two ligatures, a curved needle to pass the ligatures through the abdominal wall, and a second small piece of wood to knot the ligatures over.]

The method of performing the operation is simple, but it requires some care and confidence for its effective completion. The fore-finger of the left hand oiled, is inserted into the inguinal canal, and the scrotum invaginated is pushed before it up to the internal ring with firm and decided pressure. One ligature, strong and well waxed, is then threaded in the needle, the point of which is insinuated along the palmar aspect of the finger on its radial side, until it has reached the extreme apex of the invagination; it is then forced through the abdominal parietes, and appears on a line with the anterior

superior spine of the ilium; about 1½ or 2 inches internal to. The needle is then unthreaded and withdrawn, to be threaded with the second ligature, and again introduced, this time on the other side of the finger, to be pushed through the abdominal wall as before; this time transfixing a short distance from the point where it first pierced, but emerging through the same opening in the integument.

The needle is again unthreaded and withdrawn. The plug is now pulled into the canal, the apex being firmly tied against the apex of the invagination, and the threads firmly knotted over the small piece of wood. The operation is thus completed.

The plug is left *in situ* for three or four days or more, until pus appears to flow freely from beside the ligatures. These are then cut, and the plug withdrawn. The discharge is gently pressed out, a pad and spica bandage are applied, and the patient is kept in bed and cautioned not to strain at stool for some days. As soon as the wounds have cicatrised, a truss may be applied, which should be worn for some months, especially when any exertion is made; it may gradually be left off when the tissues have become firmly consolidated. The time occupied in treatment varies from a month to six weeks in ordinary cases; if there be much suppuration, and that have burrowed among the abdominal muscles, there may be delay, and counter-openings may be necessary; but such cases are the exception. The only one was that of a native who was attacked with erysipelas and died of pyæmia, the result of cellulitis. During the period of the insertion of the plug, the bowels generally remain confined, and indeed for several days after its removal; should they act, the patient must be warned against efforts at straining.

I find, by referring to the records of my wards, that I have, up to the end of 1867, operated sixty-seven times. In 1862, I had fifteen cases, and of which ten succeeded, one was relieved and four failed. In 1863, there were eight cases, of which five were successful, two only relieved, and one failed. In 1864, I had eight cases, of which six were successful, two relieved. In 1865, I operated in fourteen cases, of which ten were successful, three relieved, one failed. In 1866, there were seven cases, five successful, two failed. In 1867, I had fifteen cases, of which ten were successful, one was relieved, three failed, and one died.

Ram Coomas Doss was admitted on the 27th February, 1867, with inguinal hernia of left side: he was operated on 5th March, 1867, and died of erysipelas, on the 26th of March, 1867. Extensive suppuration was set up between the muscles. Erysipelas took place in the chest, the cellular tissue sloughed, and free incisions were made to expose the sloughy tissues. After death, there was found consolidation of the two lower lobes of the right lung, and one large pyæmic patch of the upper lobe. There was no cardiac coagula. There was thus a total of sixty-seven cases, of which forty-six were apparently successful; nine were relieved; eleven failed altogether, and one died.

Before discharging any of those returned as cured, they were submitted to the severest tests, lifting weights, climbing up a pole, jumping, running up and down stairs without a truss; and unless they were able to bear this test, they were not considered as cured. In many of these I fear the hernia may have returned afterwards. But I have seen some after a long interval, and am happy to say there can be no doubt that in these cases the improvement is permanent.

I have placed on the table a specimen illustrative of the mode in which the occlusion is effected; it was the case of a French sailor, who had been operated on some months before he met with an accident, which caused his death. You will see that the internal ring is perfectly closed. I have also brought into the room several patients who are recovering from the operation, and so far they promise to do well. I have also some persons who were operated on at different periods of time past, and you will be able to judge by them how far we may, in favourable cases, hope to succeed. I would here repeat what I have often before stated, that I regard the oper

tion as one of a somewhat uncertain character as to its results, but offering a sufficient prospect of success to warrant the surgeon. and justify the patient, in attempting it.—*Brit. Med. Journal, Aug.* 8, 1868, *p.* 136.

56.—ON LUMBAR COLOTOMY FOR THE RELIEF OF INTRACTABLE DISEASES OF THE RECTUM.

By T. B. Curling, Esq., F. R. S.

[Four cases are related in this paper, of which we give the substance of the first, and the second in full. In the first, which was cancer of the rectum, the operation is thus described:]

Mr. Curling made a transverse incision between four and five inches in length; the incision was then carefully deepened, the muscular substance cut through, a little fat dissected away, and the colon bulged into the wound. A large nerve came into view, but was pushed aside; there was at first a little arterial bleeding, but the vessel could not be found, and on deepening the incision the hemorrhage ceased. The colon having been exposed, two thick ligatures, having a needle at each extremity, were passed through it. one near each end of the wound. The gut was next opened with scissors, and attached to the edges of the wound by means of the ligatures previously passed through. The lateral end of the wound was closed by two wire sutures, and the patient removed to the ward. A piece of spongio piline was ordered to be laid over the wound, and kept wet with the following lotion, Tr. iodinii ʒiv. aquæ ℥viij. The patient to have a draught of warm brandy-and-water, and afterwards tr. opii ♏xl.

[Great relief was obtained, but of course the original disease progressed to a fatal termination.]

This case shows the benefit which may be gained by lumbar colotomy in relieving the sufferings attending cancer of the rectum. An artificial anus appears very repugnant to persons in health, but the distress which arises from frequent painful scalding motions, and from incontinency, is so great that it is not surprising that patients are willing enough to submit to this operation in order to get relief, even without any prospect of ultimate cure. There can be little doubt, however, that life was prolonged in the case just related, by the removal of one great source of exhaustion.

In my work on *Diseases of the Rectum* (3rd edit. p. 145), I have remarked that we sometimes meet, especially in hospital practice, with old, inveterate and neglected strictures, in which the disease is too far advanced to offer any prospect of being benefited by dilatation. And, in spite of all our care and palliative remedies, the disease will continue to make progress, wearing out the patient's strength, and ultimately proving fatal. My experience in the performance of lumbar colotomy having impressed me with its freedom from any unusual risk, I resolved, when a case of stricture of the rectum, such as I have just described, came again under my care, to suggest this operation to the patient, in order to obviate the misery attending the disease, and to prolong life in a state of comparative comfort. This was done in the following case.

Case 2. Intractable stricture of the rectum successfully relieved by establishing an anus in the left loin.—M. A., aged 26, a farm labourer from Essex, was admitted into the London Hospital, December 3rd, 1865, on account of disease of the rectum. He was sallow, and had an emaciated cachectic appearance; he had suffered from disease of the rectum for more than twelve months, and complained of great difficulty and pain in defæcation with straining. He was also troubled with a constant watery discharge, more or less tinged with blood. He had been many weeks in St. Bartholomew's Hospital, where he had undergone some operations. On the 8th I examined the bowel and detected a close stricture about two inches from the anus. It was so tight and firm that I could introduce only the point of my finger into it. The bowel below the stricture was thickly studded with vegetations, and there

were some flaps of integument round the anus. The examination caused great pain. I placed him upon a nourishing diet with wine, and directed a No. 7 elastic gum bougie to be passed on alternate days. This was done by Mr. Colquhoun, the dresser. In a few days the size of the bougie was increased to No. 8, and on the 20th to No. 9. During this treatment he suffered from diarrhœa, which was checked by astringent mixtures. The watery discharge from the rectum also continued very profuse. The passage of the bougie caused considerable pain, and was discontinued. His health was falling off.

Feb. 2. I ordered a solution of nitrate of silver (gr. x $\frac{z}{5}$j) to be applied with a camel's hair brush to the stricture and bowel below it. As the stricture did not yield to treatment, the pain and irritability of the bowel increasing, and he was gradually getting weaker and worn out by the disease, I suggested to him on the 8th to undergo lumbar colotomy, and explained the nature and object of the operation. In a week afterwards, having consulted his friends and being satisfied that he was getting worse, he consented to the operation, which was performed on the 14th in the usual way; the colon being previously well distended with linseed tea injected through a long tube passed beyond the stricture. He recovered favourably from the operation. The fæces escaped freely from the artificial anus, but there was a free discharge of a slimy mucous fluid per anum. This was checked by injections of tannic acid into the rectum below the stricture. About a month after the operation he passed some liquid feculent matter by the natural passage for two or three days, but afterwards all evacuations took place from the loin. Subsequently rather strong injections of chloride of zinc were substituted for the tannic acid, and used two or three times a week with the view of reducing the vegetations in the bowel. With what effect I could not ascertain, as the patient, finding digital examinations painful, persistently refused to allow me to make one. The discharge, however, diminished a good deal. He improved in health rather slowly; became exceedingly timid about any surgical interference, and left the hospital of his own accord at the end of May.

I saw nothing more of the man until February 22nd, 1867, when he visited the hospital; he was looking pale, weak, and out of condition, and stated that he was doing no work, not feeling equal to it. He was on parish allowance; he suffered no pain in the rectum, and no evacuations occurred by the natural passage, but there was a slight discharge occasionally from the rectum; he refused to allow me to examine it. There was a considerable prolapsus of the bowel at the artificial anus. It was easily reducible, and subsided spontaneously when he was recumbent. He wore a belt, but it was not fitted with a proper pad to restrain the prolapsus; his bowels acted once and sometimes twice a day.

Though the operation in this case fully answered the end in view, in relieving the patient of the pain and other troubles resulting from the stricture in the rectum, his constitutional improvement was not so great afterwards as I had hoped for, which, no doubt, was greatly due to his having a naturally unhealthy constitution, as well as to his indigent circumstances, which made it difficult for him to procure a sufficiency of good, nutritious food.—*Clinical Lectures and Reports of the London Hospital*, 1867–8, *p.* 1.

57.—TREATMENT OF HEMORRHOIDAL AFFECTIONS.

By John Wiblin, Esq., Southampton, and Henry Smith, Esq.

[Mr. Wiblin states that he has operated upon thirty-three cases of hemorrhoidal tumours by means of Mr. Smith's clamps. Some of these cases were of a formidable character, and all obtained the most complete success.]

In one case, that of a Colonel B., who, on his return from India, broken down in health, anæmic, emaciated to an extent I have never before wit-

nessed from repeated loss of blood, I found a large pendulous hemorrhoidal excrescence, very much resembling in shape a moderate-sized bunch of grapes, with a large exposed surface of intestinal mucous membrane. Having placed the patient under the influence of chloroform, I removed the whole of the mass, and four tolerably large portions of mucous membrane, by means of three clamps, without the loss of more than an ounce of blood. The patient was confined to bed for five days only, never having experienced a single symptom calculated to interfere with his rapid recovery. At the expiration of the time I have mentioned the gentleman was able to take carriage exercise; he made a rapid convalescence, and he is now in the enjoyment of perfect health.

The clamp modified and perfected by Mr. H. Smith is admirably adapted for the purposes for which it is advocated, and I feel persuaded that any surgeon who will take the trouble to employ the clamp method of removing piles, will find that it possesses great advantages over the barbarous practice of the ligature operation. The result of my experience testifies to the total absence of secondary complications in the former, and to very frequent retention of urine and a return of the disease after operative procedure in the latter.

The toy-like ivory appendage to Mr. H. Smith's instrument I regard as unnecessary, and only calculated to increase the already extravagant charges of the instrument maker.

[Mr. SMITH, after expressing his pleasure at Mr. Wiblin's favourable report of the utility of the clamp in the treatment of hemorrhoids, observes :]

I must take exception to Dr. Wiblin's remark at the end of his letter. He says :—"The toy-like ivory appendage to Mr. H. Smith's instrument I regard as unnecessary, and only calculated to increase the already extravagant charges of the instrument maker."

Now, with regard to this point, perhaps you will permit me to state that, next to the securing of perfect parallelism of the blades of the clamp, I regard this "toy-like appendage" as the most important part of the instrument; and I can speak of it more freely as the suggestion to line the outside of the blades was due, not to myself, but to Dr. Vine, of Covent Garden, who assisted me in nearly all my earlier operations, and who always took a great deal of interest in the perfecting of the clamp. This ivory sheathing acts as a non-conductor of heat, and thus the heated iron may be applied very freely without the production of pain or damage to the parts upon which the clamp rests. Of course, if chloroform is used, the metallic blades alone may be employed; but I should say that in more than fifty per cent. of my cases I do not give chloroform, and then it is we see the value of the "toy-like ivory appendage."

I have been anxious to give this explanation of the reason why I use the ivory sheathed clamp, because next to that almost absolute safety attending this treatment, as much freedom from pain as is possible to the patient should be sought for, and that object will be best attained by using a clamp possessing the "toy-like appendage" which my worthy friend thinks "unnecessary," but which I am sure he will always for the future use, after this explanation.—*Lancet, Sept.* 19 *and* 26, 1868, *pp.* 396, 426.

58.—CASES ILLUSTRATING THE TREATMENT OF HEMORRHOIDS AND PROLAPSUS OF THE RECTUM.

Under the care of HENRY SMITH, Esq., at King's College Hospital.

Those who have been in the habit of attending the practice and operations at King's College Hospital, are familiar with the method which is adopted by Mr. Henry Smith for the treatment of hemorrhoids and prolapsus of the rectum. This process, together with a description of the instrument used, was first made known to the profession in the Lancet of Oct, 4th, 1863. (See

Retrospect, July to Dec. 1863, p. 117, and also July to Dec. 1862, p. 100. This article contains a woodcut of the instrument.) It consists in the use of what is termed the "hemorrhoidal clamp," by means of which the tumours are seized and compressed. They are then successively cut off by scissors, and the divided bases of the tumours are thoroughly cauterised by the hot iron. At an earlier period nitric acid was used for the purpose of arresting the bleeding, but on one occasion some serious loss of blood occurred, and Mr. Smith has since trusted entirely to the actual cautery, which, if properly applied, thoroughly arrests any bleeding.

Mr. Smith has now used this method of treatment very extensively in the most severe forms of hemorrhoids and prolapsus of the rectum, and the success attending it has been such as to cause its adoption to a great extent both in this country and the colonies. Of the numerous cases which have occurred in the hospital, there has not been a single instance where any bad result whatever has taken place, and only one instance in which the treatment has failed to cure the disease. The merit of the plan consists in its being free from danger, and in insuring for the patient a very short convalescence as compared with that following the use of the ligature. In by far the majority of the cases the patients have left the hospital on the fifth day, or within a week; and in several instances Mr. Smith has performed the operation in the out-patient room, but, except in some cases, he does not recommend this, as perfect rest after the operation is very desirable. When mucous membrane alone has to be removed, the pain is so slight that Mr. Smith never administers chloroform; but when, as is often the case, there is a considerable amount of skin to be removed, he employs anæsthesia. The absence of anything like severe pain on the use of the cautery is accounted for by the fact that the clamp is lined on the back of the blades with ivory, so that the heat is not transmitted through the metal to the surrounding parts.

We will insert a few cases, to illustrate this mode of treatment, from Mr. Smith's case-book.

Case 1.—M. C., aged 48, suffered from bleeding piles for fourteen years; the hemorrhage has continued for three days at a time, and has latterly burst out after walking any distance. On examination, a mass of bright vascular hemorrhoidal tumours was found protruding from the anus. On the day after admission (July 20th), the bowels having been well cleared by castor oil, the tumours were successively seized by the hooked forceps, embraced by the clamp, and then cut off; the actual cautery was applied to the base of each, bleeding being completely arrested. No bad symptom followed the operation. The bowels were kept locked up by the opium until the 23rd, when they were acted upon by castor oil. She was discharged on the 26th.

Case 2.—J. C., aged 61, terribly blanched by hemorrhage from the rectum, was admitted into the hospital July 19th, with a large prolapse of the entire circumference of the mucous membrane of the gut. The operation was performed July 20th. The clamp was applied to as many as five segments of mucous membrane. Cautery also was used. The hemorrhage was completely controlled. No bad symptom followed. The bowels were acted upon by castor oil on the 23rd; and the patient, although much reduced by the previous hemorrhage, was able to go out of the hospital exactly a week after the operation.

Case 3.—J. C., aged 40, admitted into the hospital on April 17th. On examination, four large internal hemorrhoids, of a bright vascular character, protruded at the anus. The operation was performed on the 18th, four tumours being removed. Cautery completely checked the bleeding. No bad symptom followed and the patient was discharged from the hospital on the 22nd.

In the following case there is presented an instance of one of the worst forms of prolapsus, and one but rarely seen. It was the case we have alluded to, where the operation by the clamp failed to produce a cure. Mr. Smith was of opinion that he did not remove enough of this prolapsed membrane. And it is probable that the removal of a greater amount of skin at the first operation would have been more useful. The effect of the treatment by a

combination of the nitric acid with very free excision of the relaxed skin is well illustrated here. If this treatment had not succeeded Mr. Smith's intention was to use the clamp again much more freely than he did at first.

Case 4.—Mrs. W., aged 50, was admitted in the early part of July, under the care of Mr. Henry Smith. She had an enormous prolapse of the rectum, consisting apparently of the entire coats of the bowel. The mucous membrane was smooth and vascular, and scarcely at all altered in its texture. The tumour was nearly the size of an infant's head, the surrounding skin was loose and thick, and the anus was so dilated that the entire hand could be introduced. The affection had been the source of the greatest misery to the woman for many years; and, in 1866, she had been under the care of Mr. Smith, who had operated with the clamp, removing some superficial portions of mucous membrane, and excising some slips of skin from around the anus. But the relief was only partial, and it was Mr. Smith's intention to perform a second operation; but the patient remained away until the present time, when she returned with her disease quite as bad as before. As the mucous membrane was so entirely unchanged, and as the prolapsus seemed to depend greatly upon the laxity and weakness of the anal orifice, Mr. Smith determined to try the effect of nitric acid to the mucous membrane, and a free removal of the skin around the anus.

On July 11th, chloroform being given, strong nitric acid was applied to the entire surface of the prolapsed bowel with the utmost freedom. The skin from around the anus was next removed in long and deep slips at right angles to the orifice. The bowels were kept locked up for four days, when they were acted upon by castor oil without the least prolapse. The wounds slowly healed, and produced a firm cicatrix. The patient was kept in the hospital for a month, without the least appearance of prolapse, and it is to be hoped that the cure will be permanent.—*Lancet, Sept.* 5, 1868, *p.* 311.

59.—ON THE TREATMENT OF HEMORRHOIDS.

By Dr. J. Mulvany, Assistant-Surgeon Royal Navy.

Few diseases occasion more distressing sensations than internal hemorrhoids; few are productive of more corporal debility, or mental disquietude—irksome to the patient, hitherto contumacious to the physician, they have long afforded an arena for the exercise of surgical skill: the number of remedial agents which from time to time have been recommended for their removal, affording at the same time ample evidence of the fecundity of the inventive genius of the faculty, and the intractability of the affection. Blisters, the actual cautery, persulphas, and perchloras ferri, the knife, the ligature, separately and conjointly, have been warmly extolled. Latterly, to the application of nitric acid, first, I believe, used in Dublin, is unanimously conceded the largest meed of laudation. But however efficacious such an application may be, the nervous, debilitated, chronic sufferers, who form the majority of those seeking surgical aid in those cases, will not submit without repugnance to the employment of so potent an agent. A simplification of the mode of treatment, sans the knife, nitric acid, *et hoc genus omne*, occurred to me, might be suggested by a careful consideration of the anatomy during health, and the pathological condition during varix of that portion of the alimentary canal, which may be termed the hemorrhoidal region, extending from the anus to a line or two above the internal sphincter. Superiorly, this is lined by mucous membrane, by no means intimately adherent to the subjacent tissue; inferiorly its character changes, and becomes muco-cutaneous; whilst, in the middle third, we find the cutaneous element prolonged into triangular vertical linguettæ, named by Morgagni, the columns of the anus. At their junction, *en bas*, they form a number of valvular folds more or less elevated, with their concavities directed upwards, which are deserving of attention. Next to the mucous membrane is the cellular coat in which the

hemorrhoidal vessels ramify; more externally are the sphincters, next a few pale muscular fibres, prolonged from the longitudinal bands, imagined by Sappey to assist in dilating the anus, and which probably serve by their contraction to assist the movement of the venous blood through the superior hemorrhoidal vein. Next in order we have the levator ani, and then a soft yielding, adipose cushion filling up the ischiorectal fossa. The vascular supply, derived from the inferior mesenteric, internal iliac, and pudic arteries is returned by two sets of veins into the systemic and portal systems. By the inferior hemorrhoidal, the blood collected from the anus and external sphincter, is poured into the internal iliac. This vein differs from the superior in its comparatively short course, and its being provided with valves. The superior hemorrhoidal, commencing in an intricate network, much more extensive than that of the inferior, situated beneath the semilunar valves of Morgagni, ascends into the abdomen as a tributary of the portal.

Thus we see that this vein is pre-eminently disposed to varix, from a variety of causes, viz.:—its length, rendering it so liable to pressure; its opening into the splenic, almost at right angles behind the pancreas; its blood having to pass through the liver; its being unprovided with valves; the tendency of the Morgagnian festoons to obstruct the passage of hardened fæces and favour their impaction; their relation to the venous plexus, whereby this will probably be dragged down, when prolapsus of the mucous membrane occurs from the pressure of impacted fæces; straining at stool, &c.; the laxity of the mucous attachment; the yielding walls of the canal and constitution of the muscular planes during defecation, contribute towards the same result.

The immediate causes of hemorrhoids are such as lessen the *vis a tergo*, or impede the venous current, *a fronte*, the former constituted by general muscular relaxation, and diminished contractility of the hemorrhoidal arterial coats, as frequently results from residing in the West Indian climate. The latter, by mechanical impedimenta, removable or irremovable. Of the removable, constipation is by far the most frequently exciting cause, for, when habitual, the muscular walls of the rectum gradually lose their tone and sensibility, and become more or less paralysed by the excentric pressure of the contained fæces, dilatation succeeds, and the ascending column of blood from the rectum thus pressed on, suffers retardation, is thrown back on the hemorrhoidal plexus, and varix ensues.

In warm climates, in consequence of the rarefaction of the atmosphere, the liver is called into increased activity, to supplement the lungs, and the blood is depurated by the increased elimination of its biliary elements. Thus a tendency to relaxation of the bowels, or diarrhœas, exists at the same time; owing to the debilitating effects of caloric, relaxation of the muscular tunic of the hemorrhoidal arteries takes place with partial paresis of their vasomotor nerves, as may be inferred from the dilated condition of the corresponding capillaries; hence an unusual afflux of blood to the anal region takes place, which, if further augmented by hepatic torpor, or by the constriction of the muscular planes surrounding the gut during a violent diarrhœa, such as is likely to occur in the crisis of a bilious remittent, cannot be directly propelled by the weakened heart through the portal system, and if not finding a ready outlet through the systemic veins, will, necessarily, press with increased gravitic force on the hemorrhoidal venous plexus and capillaries, and these yielding, become varicose, and pushing before them the lax mucous membrane and Morgagnian structures, descend as a hemorrhoidal tumour into the bowel, where exciting spasmodic contraction of the sphincter, and inducing irritation of the bladder, it becomes the head and front of a series of uneasy sensations, which render defecation a martyrdom, produce constipation, and thereby *emperran el mal.*

For a somewhat similar reason the disease is frequently met with amongst stokers, the heat of the fires producing muscular relaxation, and their stooping and holding the breath, with the diaphragm consequently fixed, during the act of shovelling, increasing the amount of blood in the abdominal veins.

The internal pile, so produced, is broad and vascular, has a tendency to

abrasion, bleeding, and inflammation. It may be regarded as the true internal pile, the change of shape, consistence, appearance, or character which it is apt to undergo being the effects of subsequent inflammation and effusion of lymph or blood; it differs from the external in being composed of capillaries, veins, and relaxed Morgagnian columns, in denoting a greater amount of embarrassment in the hemorrhoidal circulation, and in the external, as well as what has been called the intermediate pile, being the result of a minor degree of retardation from pressure, or causes purely local, such as heat, cold, irritation from various sources, &c.

For the purposes of treatment, hemorrhoids may be classed under three heads—1st, those requiring constitutional treatment alone; 2nd, those for which topical applications suffice; and, 3rd, those for which a combination of topical and constitutional remedies are requisite. Under the first head come the true internal pile, and that in which the capillary element is less prominent. Under the second are the external and intermediate piles, whilst the third embraces the cellular, erectile, fleshy, warty, &c., internal piles.

The rationale of treatment is extremely simple, and consists in the adaptation of remedial agents to correct the pathological conditions on which they depend—in other words, to remove constipation, restore peristaltic action, give tone to the paralysed muscular tissue of the great intestine, constringe the dilated hemorrhoidal capillaries by increasing the contractility of the middle coats of their supplying arteries, and thus enable the veins to resume their normal degree of rectitude.

In belladonna we possess an agent capable of supplying by its physiological action all these desiderata. Because, acting through the intestinal branches of the solar plexus, it will increase peristaltic action, and restore tone to the paralysed muscular fibres of the colon and rectum, by which means the bowel may be unloaded and kept in a state of solution, and pressure be thus taken off the hemorrhoidal plexus and semicircular festoons, a desideratum which may be much accelerated by the previous administration of a dose of castor oil, to clear out the bowel and facilitate absorption.

Again, by acting on the vasomotor nerves of the hemorrhoidal arteries it will promote the contractility of their muscular tunics, lessen the supply of blood to the trajetanal, and thereby check bleeding, and, at the same time, diminish the size of, and ultimately remove, hemorrhoidal tumours of the first class.

On these data, I was led to the employment of belladonna in those cases 18 months ago, and have every reason to be satisfied with it. In November, 1866, a relative of mine, Mr. M., came under my care for bleeding internal piles of two years' duration, brought on by residence in the tropics, and a severe diarrhœa. The hemorrhoid was large, vascular, very hot, protruded, and bled during defecation; gave rise to much vesical irritation; a constant feeling of fulness in the rectum; constipation; frequent desire to go to stool; much mental uneasiness; emaciation, and general debility. His sufferings were great, so great that they finally overcame a constitutional aversion which he entertained against all surgical operations; and he submitted to have anything done to give him relief. Having once induced an epileptiform fit in a much stronger patient by touching his chancre with nitric acid I determined to reserve this as a *dernier ressort*, and having cleared out his bowels with a dose of castor oil, I prescribed the fluid extract of belladonna for him in ℥iiss. doses, every four hours, and ordered a lavement of cold water, *bis die*. In two days the bleeding had quite ceased, and in ten days the hemorrhoid had entirely disappeared, and has not returned since, though the laxity of mucous membrane still continues, and causes it to prolapse slightly at stool.

To give a number of similar cases with like results would be a useless repetition. I may, however, mention that I have used it with perfect success in the case of a lady eight and a-half months pregnant; believing that the gravid uterus acted indirectly by pressure on the fæcal tract, rather than on the veins, and that the consequent accumulation of fæces was the obstruct-

ing power to the free return of the venous blood, and knowing that belladonna is extensively used in America during the last days of gestation for dilating the os uteri, I, as she was then suffering a good deal from the bleeding internal pile, put her on two-minim doses of the fluid ext. belladonna, *ter die*. A cure was effected in less than a week. I, however, continued the belladonna to the period of her accouchment, and I certainly think it facilitated her labour.

For the external pile the grease which runs from the hot bearings and eccentrics in the engine-room of a steamer when under steam, will be found an unfailing remedy. Chemically considered, it is rather complex in composition, and may be presumed to be a combination of the fatty acids and oil, used as lubricating materials, with the oxides of the more oxidisable metals exposed to friction. By the bearings are meant the fixtures in which the shaft works. They are made of brass and lined, to a certain extent, with a patent metal, composed of copper, tin, and antimony, or of zinc, lead, antimony, and platinum. The shaft is formed of wrought iron, and the brass is composed of copper, zinc, and tin. The bulk, however, of the metals oxidised, judging from a rough analysis I made, is formed of the copper and lead. There was hardly a trace of zinc, and none at all of the others found in a drachm of the ointment.

As the liquefied grease drips from the bearings, it is caught in a "save-all," and on cooling is fit for use. It should be mixed with one-eighth its bulk of lard. It then forms an ointment of a pale blue colour, the efficacy of which is so well-known to the stokers that they treat, *sub rosa*, nearly all the cases of piles that occur on board ship. A chief stoker of my acquaintance told me he had treated successfully over fifty patients. He used it indiscriminately for all kinds of piles. From my own experience, I can only vouch for its utility in cases of the external or intermediate varieties; but lately I treated a stoker with it whose anus was festooned with mariscœ, without putting him on the list or getting him excused from duty. He was rid of his garnitures in about a fortnight. It proved equally efficacious in the case of a jockey from the United States, who suffered from the internal, fleshy, and external piles during a number of years, and who had to resign his occupation in consequence. It is needless to say this man had numberless remedies recommended, but *cui bono?* His occupation was gone, and could not be pursued until the ointment gave their *congé* to his unwelcome guests.

For the varieties of internal hemorrhoids which come under the third heading, the castor-oil and belladonna, administered by the mouth, and the ointment applied locally, will usually suffice. How the ointment acts I can only conjecture, but can recommend it with confidence as safe, efficacious, and productive of but very little pain. It will, I think, be generally found that if nature dispenses afflictions to the human race with her left hand, she showers their panacea on us with her right; and if she sends sickness and disease in our midst, she also places their remedies within our reach, and leaves us to find them. To the Bolivians, for their various calenturas, she has given the Calisaya. If the bothriocephali find a commodious habitat in the dura ilia of the vassals of Theodorus, or perhaps in those of his sable majesty himself, has not nature drawn up a process of ejectment in the flowers of the Brayera Anthelmintica, which will not endanger the life of a bailiff to serve?

Do not the natives of the West Coast of Africa, when suffering from dysentery, find its specific in the fruit of the banana, prepared *secundum artem*, and found growing in the greatest profusion? and could she be less bountiful to stokers? No; if she permits the heat of the stokehold to festoon the anus of the stoker, she also prepares in an impromptu laboratory, in which the shaft and bearings, converted into a pestle and mortar, rub up the lubricating materials, and by means of heat, friction, and the atmosphere, produce an unguent calculated to remove his questionable decorations—one which, to use the language of an enthusiastic stoker whom it recently quit of such appendages, "is worth its weight in gold!"—*Medical Press and Circular*, *June* 10, 1868, *p.* 497.

60.—EXTRACTION OF A SEWING NEEDLE FROM THE RECTUM 5 DAYS AFTER IT HAD BEEN SWALLOWED.

Case under the care of Mr. Hulke, at Middlesex Hospital.

Slender, flexible, though strong objects, as small fish-bones, commonly enough traverse the alimentary canal when swallowed and are voided *per anum*; the same not uncommonly happens when a pin is swallowed. Needles frequently pierce the walls of the canal, and produce grave results. An instance of this, where a needle pierced the aorta and gave rise to fatal hemorrhage, was reported not long since from this hospital.

In the following case, however (for which we are indebted to Mr. Thomas Flower, Senior House-Surgeon), the needle did not cause any inconvenience till it reached the rectum, where its arrival was marked by extreme pain. A man, aged 37, came to the out-patient room January 17th, 1868, stating that five nights before, while drinking a pot of beer, he felt something scratch his throat, but he had not thought anything more of it. He complained now, however, of pain in the lower bowel, so severe that he compared it to a stake being thrust into him. It had come on suddenly the night before, without any assignable cause. No fissure on the verge of the anus or other cause calculated to produce such suffering could be seen, but at the depth of the forefinger what was at first thought to be a pin could be just felt. The sphincter ani was so spasmodically contracted and the examination so painful, that the foreign body could not be removed without chloroform, under the influence of which a slender three-bladed urethral speculum was passed, and a sewing-needle with a loop of thread was removed with forceps. One end of the needle was sticking in the gut, while the other end was free and directed upwards. A little soreness continued for a few days, after which no more inconvenience was felt.—*British Medical Journal, July* 4, 1868, *p.* 7.

61.—ON SOME NEW METHODS OF TREATING DISEASES OF THE CAVITIES OF THE NOSE.

By Dr. J. L. W. Thudichum.

I. *The Medical Lantern.*

Those who have tried sunlight for the inspection of the nose or larynx, and compared it with the light given out by oil-lamps specially adapted to the operation, and provided with complicated condensers, must have come to the conclusion that the latter are relatively useless. At all events, my own practice soon made me dissatisfied with such arrangements as Tobold's lamp—instruments which I found top-heavy and unstable, and whose horizontal beam of light did not satisfy my demands for inspection, much less my requirements for illumination during operations. I therefore established a platform before the window of my consulting room, in order to be able to utilise sunlight, thrown into the room by means of a heliostat, on all practicable occasions. Some diagnoses and operations which I had opportunities of making by the aid of this light, and which I am convinced could not have been made with the aid of an oil-lamp, however artfully devised, caused me to construct the following adaptation of Drummond's light to medical purposes:—

A small lantern carries the arrangements which are required for the production of the spirit-oxygen-lime light. The glass spirit-lamp is screwed into the bottom of the lantern, in order that the level of the spirit may be always accessible to the eye. The rest of the arrangements, including an annular ditch round the burner, to be filled with water intended to cool the burner, are inside the lantern. The oxygen is supplied from an iron bottle underneath the lantern, in which it is contained under pressure produced by the condensation in it of several atmospheres of gas. A delicate screw-valve, moved by a lever, easily regulates the flow of gas. The bottle and lantern are fixed to a stand, being a brass rod screwed in a heavy circular iron plate.

Any position can be imparted to the lantern by means of the ball-and-socket joint on its attached side, and the screw sliding clamp, which fixes it to the rod. The light passes through a system of condensers in front of the lantern, and can be brought to a focus at any desired distance by the sliding arrangement of the bottom of the lantern which carries the light. The instrument, including the compressed gas, is manufactured and sold by Mr. John Orchard, optician, of Kensington.

The lantern in this form is eminently practical. It is easily lighted: a match inflames the spirit, the lime is fixed by its side, the oxygen is turned on, and within a minute or two a splendid beam of light is projected from the condensers. The direction of the beam is readily adapted to the requirements of the operator. For laryngoscopy and rhinoscopy he carries the concave mirror on his forehead over a screen, which, as the light comes from above, can be so adjusted as to completely protect the eye from any incident rays, and leave it all its pupillary space for the inspection of the illuminated cavities. The lamp is put out as easily as it is lighted: the oxygen is turned off; the lime-cylinder buried in lime-powder in a suitable receptacle; the spirit extinguished by a brass cap which fits into the water-ditch. The amount of gas in the bottle can always be controlled by a pressure gauge to be screwed on to the top of it. A full reserve bottle is always kept in store, and an empty bottle is at any time refilled by the maker. I pronounced this apparatus (which I exhibited last year at a *conversazione* at the Royal College of Physicians, and which I have now tried on many occasions during nearly two years), to be perfect, and greatly to be recommended to the profession, particularly for application in hospitals, but quite as suitable for the consulting room of either physician or surgeon.

II. *Rhinoscopy and Nasal Specula.*

Hitherto the inspection of the nasal cavities from the side of the pharynx, choanoscopy, has been practised much more systematically than that through the nostrils. This has asisen through the impetus given to laryngoscopy, of which rhinoscopy was considered to be a mere appendix. But the neglect of what, in contradistinction from posterior rhinoscopy or choanoscopy, I will term anterior rhinoscopy, is mainly due to the remarkable circumstance, that there were no proper specula by means of which this operation could have been accomplished. The only speculum I could find in the shops bore the name of Liston, and was not suitable for my purpose. I therefore constructed a series of specula to suit many cases and requirements, and ultimately retained the following forms as highly practical:—

Two valves are held together by a spring, and when compressed form a canal of oval bore, about $\frac{3}{4}$ in. in length. The valve which expands the ala is from $\frac{1}{4}$ in. to $\frac{3}{8}$ in. longer than the valve which is placed against the septum. This latter inner valve should never be long enough to reach the sensitive part of the mucous membrane of the septum. It follows from this that each nostril requires its own speculum. There must therefore be for each case a right and a left speculum. As the nostrils of different persons vary greatly in size, different sizes of pairs of specula must be at hand in practice. The speculum is inserted into the nostril while closely compressed; the moment the spring is liberated the nostril is fully expanded, and if the operator now draws the spring, which serves also as handle, upwards, the cavity of the nose can be fully inspected. The speculum; therefore, is designed exclusively to expand the atrium or membrano-cartilaginous part of the nostril; if it were allowed to enter beyond this, and to reach the isthmus formed by the unyielding cartilaginous septum and the nasal margin of the ascending branch of the upper maxillary bone, it would cause pain, and narrow by its own thickness this small passage. The new specula, several sets of which have been made for me by Messrs. Weiss, cause no pain, widen the atria to the utmost extent, and admit of the introduction through them, into any part of the nose, of instruments necessary for slight, delicate or severe operations.—*Lancet, Aug.* 22, 1868, *p.* 243.

62.—ON THE OPERATION FOR NASAL POLYPI.

By Dr. J. L. W. Thudichum.

The operation for nasal polypi, as hitherto practised in all countries, consisting as it did in the tearing out of these growths by means of a pair of forceps, has always, and more particularly when I was obliged to perform it myself, appeared to me one of the most barbarous proceedings of surgery. The bruising and general injury to the nose were very great; one or other of the shell bones was mostly broken; the bleeding was always profuse; and the suffering of the patient was so extreme that it required the greatest energy on his part and on that of the operator to enable him to endure to the end. Very commonly the patient and operator had the mortification of finding the polypi to grow a second and a third time, or to relapse even more frequently than that; many persons who had had one taste of the operation dreaded its repetition, and kept their polypi. The operation could not be ameliorated so long as the instrument used for it filled the entire introitus of the nose—so long as the blades of the forceps, however thin they might be, had to be opened in a narrow and unyielding canal—so long as the objects to be seized could not be seen at the time of seizure. A usual result of the proceeding was that small polypi were jammed up into the narrow parts of the cavity, and were thus made the certain origin of subsequent growths, or so-called relapses. In almost all cases the sense of smell, which had been only impaired by the polypi, became totally lost after the operation. I therefore threw aside the forceps altogether, and endeavoured to apply the electro-caustic method, which had not heretofore been used for this operation, and was rewarded with the most perfect success. Indeed, operations in the nasal cavity may now be made to vie in delicacy with operations upon the eye, and the opprobrium so acutely felt by most surgeons with whom I have had an opportunity of conversing, is now removed from this chapter of science, and from this drawer of the surgical armamentarium.

Besides the medical lantern and the specula it requires the following apparatus:—

1. Platinum-wire, loop-carrier and pully, with handle. The loop-carrier must be so thin that, while it is in the nostril, the eye can see the interior of the nasal cavity. It is therefore made of two very thin gilt brass tubes, isolated from each other by a layer of unspun silk wound round the tubes and varnished with shellac. The part of the loop-carrier which during the operation remains outside the nose is so bent aside or downwards that it is neither in the way of the eye nor in that of other instruments. This loop-carrier is fixed in the conducting handle, which bears the windlass. The handle and windlass which I used are copied from Middledorpf's instrument, made by Pischel of Breslau, exhibited in the last London Exhibition, and now in the possession of St. Thomas's Hospital.

2. An electrical battery of five large Grove's elements, mounted in the best style, with platinum plates and gilt incorrodible connexions. The power yielded by such a battery is sufficient to make any necessary length of platinum wire white-hot; it is serviceable for all other electro-caustic operations which occur in surgical practice; and such a battery has therefore, at St. Thomas's Hospital, taken the place of the much too powerful and unwieldy, and in the working much less economical, instrument supplied with the Exhibition instruments from Breslau.

3. Connector and conductors. Formerly, wherever the electro-cautery was applied the services of a special assistant were required to establish the connexion and let the current pass. This was so highly inconvenient that I had an instrument made by the aid of which the operator could at any time make and interrupt connexion by means of his foot. In the engraving the right foot of the operator is in the act of pressing down the button fixed in the end of the board on which the battery stands, and on the under-side of which the circuit is by this action established. A spring in connexion with this button is made of such strength that the mere weight of the foot does not bear it

down; it is necessary to put the foot strongly on the button in order to establish connexion.

We will now suppose everything to be arranged; the lantern burns brightly, and the mirror fixed over the shade before the eyes of the operator throws a brilliant light into the nasal cavity of the patient; the head of the patient is resting against the assistant, who steadies himself by means of his left hand on the back of the chair, and with his right holds the speculum upwards, resting his thumb gently on the patient's forehead; the loop of soft platinum-wire is introduced into the carrier, and connected with the windlass; it has been white-hot a moment before, and is now cool again. Everything is ready, and the operation proceeds. The platinum loop is passed over the polypus; it is then constricted round its pedicle by means of the windlass; connexion is made with the foot, and after a slight hissing noise indicating the burning off the pedicle of the polypus, the growth, mostly yet attached to the platinum, can be withdrawn from the nose entire. There is usually no bleeding, and the place where the polypus was attached is marked by a white stripe or spot. The patient has suffered some irritation from the instrument, and perhaps been obliged to sneeze, but after the use of his pocket handkerchief is quite ready to proceed to the extraction of the next polypus.—*Lancet, Sept.* 5, 1868, *p.* 307.

63.—ON THE TREATMENT OF CORYZA, OR NASAL CATARRH, BY "A TOTAL ABSTINENCE FROM LIQUID."

By Dr. C. J. B. Williams.

[Dr. Williams in the article "Coryza," published in the Cyclopœdia of Practical Medicine in 1833, after giving the usual treatment by aperients, diaphoretics, and diluents, adds:]

"It is the acrimony of this discharge (from the pituitary membrane) which reacts on the membrane and keeps up the inflammation and its accompanying disagreeable symptoms. On this circumstance depends the efficacy of a measure directly opposed to that just noticed, but to the success of which we can bear decided testimony—we mean *a total abstinence from liquids.*" "This method of cure operates by diminishing the mass of fluid in the body to such a degree that it will no longer supply the diseased secretion." "The coryza begins to be *dried up* about twelve hours after leaving off liquids; from that time the flowing to the eyes and fulness in the head become less and less troublesome; the secretion becomes gelatinous, and between the thirtieth and thirty-sixth hour ceases altogether. The whole period of abstinence needs scarcely ever to exceed forty-eight hours."—*British Medical Journal. June* 6, 1868, *p.* 554.

URINARY ORGANS.

64.—ON LITHOTRITY.

By Sir Henry Thompson, Bart.

[The history of the instruments employed in lithotrity is interesting. The instrument in present use is a great improvement upon the original one of Civiale. It is due in part to Sir Henry Thompson's own design, and in part to Messrs. Weiss.]

In what respect does it differ from others? In this, that it enables you to operate in less time, and with less movement or shock to the bladder, than any other instrument; and time, you know, is a matter of importance. It makes a good deal of difference to a patient whether you retain in his bladder an instrument for three minutes or for one minute. If you pass a bougie

into your bladder at once and withdraw it, you may experience very little discomfort; but leave it there for three or four minutes, and see how you like it. Every half minute after the first, the pain increases. The mere sojourn of the instrument in the bladder is a source of irritation precisely corresponding to the time it continues there. Anything, therefore, that will diminish the time of the operation and the amount of movement and concussion will necessarily give you a greater prospect of success.

Now for the proceeding itself. There is no operation that I know which demands attention to so many minute details, all of them being very important. For its successful performance it is essential that the surgeon should not only attend to the operation pure and simple, but to all the details connected with the case. Lithotrity neglected had better not be done at all. Either let it be done according to certain principles, and with great attention to detail, or let lithotomy be performed instead. One naturally recoils from many details; it is therefore essential to find out what principles regulate them. And, happily these are very simple. What is the problem to be solved? It is to remove a stone from the patient's bladder without inflicting a wound, however small, either in employing the instruments or in removing the fragments. That is what we have to aim at.

Now, I need not say that by any cutting operation that is impossible. There is at the outset a severe injury to the patient in the shape of a large and deep wound, and it is this which, in any form, is always a risk. Let us see how far we can hope to solve the problem by lithotrity. All the chances of injury possibly arise from these two sources: the stone itself, and the instruments used to extract it.

First, the stone. In its natural condition, as we know, it occasions no dangerous injury to the bladder, although it causes much pain, and ultimately chronic disease. But when it is broken up into large angular fragments with sharp edges, it becomes a source of injury, and severe cystitis may be thus readily induced. These should be pulverised one at a time; you do not attack them all at once, and break them up indiscriminately into sharp pieces. Then you will take care that this debris is not hurried away when first made, and while it is sharp; if it can remain in the bladder two or three days before it passes, it will become somewhat water-worn, and will pass more easily; at the same time the urethra will be less sore, and in better condition for its transit. It is as well also sometimes to promote the flow of urine by giving diluents and diuretics. Secondly, the instrument used, and the method of manipulating it, may be productive of much injury both to the bladder and to the urethra. It has therefore been an object with me to lessen as much as possible the number of instruments employed, the amount of manipulation applied to them, and the time devoted to the process. I have shown you how, in conformity with this principle, I have endeavoured to produce an instrument which should give the least possible irritation. And I will only add that if we can get an instrument which will do its work with less disturbance still, it will be, *pro tanto*, a valuable step in advance.

Now as to diminishing the number of instruments used. Formerly it was laid down as an axiom that you should never use a lithotrite in a patient's bladder unless it contained a known quantity of urine or other fluid. Hence the urine was always withdrawn before introducing the lithotrite, and four or five ounces of water were injected. I have shown that these preliminary injections are wholly unnecessary, and I never use them—never even asking a patient to hold his water beforehand, nor when he micturated last. I am perfectly indifferent whether he has one ounce or four ounces of water in his bladder, objecting only to a large quantity. If there is a small stone, with a large quantity of water, you may hunt long before you find it—a proceeding which will give much more pain and uneasiness than if a small quantity of water only were present. It is said, "If there is only a small quantity of water, how can you be sure that you will not injure the coats of the bladder in endeavouring to seize the stone?" There is no difficulty in that respect, because these instruments are so constructed that you could scarcely

lay hold of the bladder with them if you tried to do so. When you had instruments in which the blades closed upon each other accurately it was different. But these blades never do so: hence the safety of the instrument.

Then there is another species of mechanical irritation which may be met with. It was common, and it is now with some surgeons, to withdraw large fragments of stone from the bladder through the urethra. The surgeon would lay hold of them with the forceps, or with some other contrivance, and would really seem to think he accomplished something to be proud of if he drew from the bladder a calculus as large as a bean. Now in order to draw out such a calculus you must first catch it. Well, if you have once caught it, why not give one turn of the screw, and reduce it to powder? Why subject the neck of the bladder and the urethra to pain and injury by dragging through a distance of six or seven inches a sharp, angular fragment of stone? So far from looking upon it as an achievement in surgery, I look upon it as a thing especially to be avoided. Never, then, on any pretence, withdraw an instrument containing a fragment or débris too large to pass easily through the urethra. Our object is mainly to crush the stone into small broken material, which will then pass harmlessly and easily enough. Again, it was the custom after crushing to inject repeatedly and forcibly several ounces of water into the bladder, the patient being placed upright in order to remove the fragments just made. Now this is an irritating process, more so often than the use of the lithotrite, and for the reason just named I regard it as a useless and meddlesome proceeding. You see then that we get rid of the preliminary injections, the after-injections, and also the withdrawing of the fragments. As a rule, everything is to be done with the lithotrite. One good flat-bladed lithotrite will do seven-eighths of all the work. Other means, Clover's apparatus for example, which is the best of all, should be employed in exceptional cases.

Having enumerated what I believe to be the simple principles of lithotrity, I now come to the practice. Usually when you have a large stone to deal with, you begin with the fenestrated instrument—that is, one in which the female blade is entirely perforated, allowing the male to pass through it. This is always a more or less dangerous instrument; hence it is used as little as possible. I never use it unless the stone is actually so large that it cannot be crushed by the flat-bladed instrument. The edges of the instrument exactly meet, and are sharp, and the fragments made by it are always rough and irritating. Always when it is possible I use the lithotrite with flat blades—blades which reduce the stone to powder. The blades do not meet each other, and cannot catch or hurt the bladder, and the movement altogether is easier than that of the other instrument. [A patient is placed on the table.] I have told you that there is a difference in the mode of introducing the lithotrite and the catheter. You know that in passing a catheter, we in this country, stand on the left side of the patient; in France the surgeon stands on the right side. In passing the catheter for a recumbent patient you hold it somewhat horizontally; draw the penis gently over it, and give a gentle sweep, in this way, into the bladder. In passing the lithotrite a different movement is required. You may stand on either side, but it is better to be on the right side, because that is the convenient side for operating, and it is awkward to go round the patient to operate after passing the lithotrite. Well, then, standing at his right side, and partly turning your back to him, you let the lithotrite slowly and easily find its way until the shaft reaches nearly the vertical direction. Arrived at this point you retain it in that position for a few seconds, allowing it to go on in that position by its own weight, in order that it may slip under the pubic arch. This done, you gently depress the handle, and it slides readily into the bladder. There is no more easy instrument to pass than the lithotrite with ordinary management. I have now introduced the lithotrite, and have to find the stone and seize it. In order to do this I simply open the blades and close; the stone is between them. I touch the little button here, which changes the sliding movement into a screwing one, turn the handle and crush. I then disengage the button, again open and close, and now I have a large fragment between

them, and, repeating the action, again crush. A good quantity of débris results; less than a minute has been occupied, and I withdraw the lithotrite slowly and gently, and here is the débris, which you see is uric acid, between the blades. There is no trace of blood, and the patient has made no complaint of pain. If you ask him he will, I dare say, tell you that it was not agreeable; but it is nothing to take chloroform for—nothing like extracting a tooth, for example. Now we will have another patient [who is placed on the table, the other walking away]; he has had two sittings before, and knows all about it. I introduce the instrument in the same way as before. I open and close the blades, and find nothing. Turning them to the right, I feel nothing; turning to the left, I feel nothing. I then depress the shaft, and turn the instrument over, so that the blades are reversed and point downwards; I open and close, and seize a small fragment deep behind the prostate. Having crushed that piece, I open and close in the same position, and find one a little larger, and having crushed it I withdraw the instrument. This is always rather more painful for the patient than when the stone is found in the usual situation, and it occupies more time, perhaps two minutes instead of one. It is not usual to have a case of so much difficulty as that.

Now let me give you a hint about crushing, which is a very useful one. Whenever you have found a stone, or a good-sized fragment, and have crushed it, keep the lithotrite exactly in that place, and although you may have had some trouble in finding it, you will now continue to find it several times running. It reminds me of fishing for perch; when you have caught one, you may catch, perhaps, twenty or thirty more out of the same hole, if you will but stop there, and not go fishing about among the shallows. It is is the same in lithotrity. You will go on seizing and crushing if you contrive to keep the lithotrite precisely in the same place. In fact, there is what may be called a certain favourite "area" in every bladder in which to operate—a certain spot which is a favourite haunt, so to speak, for fragments of stone. If you find that out in each bladder you will always be able to crush; if you do not, you may often have some difficulty in discovering your stone. The area will, of course, vary somewhat with the position of the patient. If the patient was standing, for instance, the area would not be the same as in a lying posture. It is best to raise the pelvis two or three inches; then you get an area for operating which is not too close to the neck of the bladder. The neck of the bladder is a very sensitive part, and you should always avoid it, because in pulling out the male blade you may impinge against the neck of the bladder if you are not careful. One of your maxims in lithotrity should be never to pull out forcibly the male blade. You should pull it out carefully and delicately, so as to *feel* the neck, and it is a bad lithotrite, remember, if the male blade does not slide with perfect ease.

Now suppose that we have—at five, or six, or eight sittings, according to the size of the stone—almost if not quite removed it, a very important duty remains. It has been objected to lithotrity—and there was some truth, perhaps, in the allegation formerly, but not now, if the operation is done well—that you never made sure of getting rid of the last fragment; that you might leave a portion to become the nucleus of a future stone. But there is very little more difficulty in getting away the last fragment than any other, provided you go the right way to work. Generally speaking, in four cases out of five, the last fragment passes as the others—that is, by the patient's natural efforts. But supposing there remains a bit too big to pass—suppose you have reason to believe this from the continuance of the pain, &c.,—you then take an instrument with short, wide, rounded blades, with which you can explore easily in the reversed position. With such an one you may thus search the whole floor of the bladder with perfect safety. Now supposing you have done this, and have found a bit of stone, and do not know whether there is another—some little symptoms are left, but you do not find any more,—what is to be done? You do not know whether these symptoms are due to a fragment of stone which escapes you, or whether to the irritation

arising from the long residence of the stone in the bladder, and also, to a certain extent, to your instrumental efforts to find it. This is what I advise: wait for a week, and see whether the patient is better, and, if there is any doubt at all about it, make him take some severe exercise. I do not know anything here in London better than a long omnibus drive. Tell him to expend a shilling in omnibuses—say, between Mile-end and Kensington—and if that does not find out the fragment in the man's bladder I scarcely know what will. If he can stand that, especially if the roads are mending—if he is not worse for such a journey,—rely upon it he has not any fragment left: the irritation is due to the state of the bladder, and not to a fragment. If the latter exists, the patient will to a certainty be the worse for his drive, and, perhaps, there may be some bleeding. I admit that it is difficult to tell sometimes what the irritation is due to; and it is only by waiting and testing in some such way that you can find out.

Then there is another very good mode of getting rid of the last fragment, and also of removing fragments at any time when they are not well expelled by the natural efforts. I mean the apparatus of Mr. Clover, who, well known by his chloroform instrument, has also given us a valuable addition to the instruments for lithotrity. It is a very fascinating apparatus, and looks so well that there is some risk of its being used when not required. There are certain conditions in which the fragments never come away well. For example, a patient has no power of making water, except by a catheter; then few fragments, probably, will be passed in that way, and you will require other means. For him the apparatus in question is the very thing. After crushing, this large catheter is introduced, and the fragments are sucked out by the action of this powerful india-rubber bottle which is attached to it. The process is rather trying, however, for the bladder; and it costs rather more pain and time than an ordinary sitting for lithotrity.

One troublesome thing that very rarely happens is the impaction of a fragment. If you adopt the system of lithotrity which I have shown you, it is remarkable how seldom that happens. I have never had to open the urethra to remove a fragment in my life. I have occasionally had to remove one by the forceps, but that is very rare; and among all the complicated inventions for the purpose, I know nothing so good as the common long forceps which I show you here. During the last year, certainly, I have not even had occasion to use them. The more thoroughly you crush the stone, the less use there will be for forceps. Here is a bottle containing what I call a well-broken stone. You see it is almost powder: a very different sort of thing from that in the other bottle, where you see a large number of big fragments that were probably passed with difficulty. It is an old saying, "a carpenter may be known by his chips:" certainly the skill of the lithotritist may be known by the *débris* he makes.—*Lancet*, *May* 16, 1868, *p.* 611.

65.—REASONS FOR PREFERRING LITHOTRITY TO LITHOTOMY IN OPERATING FOR STONE IN THE ADULT MALE.

By Dr. George Buchanan, Surgeon, and Lecturer on Clinical Surgery, Glasgow Royal Infirmary; Lecturer on Anatomy, Andersonian University, &c.

[All seem agreed that as a general rule lithotomy in children is preferable to lithotrity. The point of practical interest is the selection of adult cases suitable for lithotrity.]

Now there are some cases in which I think there need be no hesitation at all: where the stone is of small or moderate size, the patient otherwise in fair health, and the bladder and urethra in a normal state. In such circumstances lithotrity may be undertaken with an almost certain prospect of success.

The doubtful cases depend on circumstances connected with the stone or the patient.

1. The stone. I believe it may be taken for granted that a mulberry

calculus exceeding three-fourths of an inch in diameter should not be so treated, from the force necessary to crush it and the sharp irregular form of the fragments. That a smaller stone of the kind may be successfully crushed I have myself had experience, but all large mulberry stones must be removed by lithotomy.

Excluding these, it may he asserted that all small and moderate-sized stones may be removed by lithotrity. No exact limit can be assigned to the size of a calculus which may be so treated, but obviously it depends somewhat on the composition and texture of the stone. Recent experience has shown that, in the hands of most lithotritists, stones of very large size have been removed with perfect safety. I have myself removed by lithotrity a calculus the débris of which weighed one ounce and one drachm of mixed urates and phosphates, and many larger have been removed.

So far as the stone is concerned, those cases are to be excluded in which the calculus is of exceptionally large size, or of oxalate of lime over three-fourths of an inch, or an inch in diameter.

If, then, it can be shown that by detecting a stone when it is of moderate size, the medical practitioner is in a position to recommend to his patient an operation which is less fatal in its results than that which alone is open to him in the later stages of the disease, a more serious responsibility lies on the members of our profession than hitherto. It is true that it is the duty of all to endeavour to make an absolutely correct diagnosis at the outset of any disease; but in this instance a mistake produces delay, which not only renders the patient less able to undergo any operation, but may prevent the surgeon from choosing the safer proceeding which he would have adopted had he seen the patient at an earlier stage. Every surgeon knows how often a single examination fails to detect a small stone; and also how often symptoms of stone are allowed to exist for a long time without a systematic examination in cases where there is enlargement of the prostate and atony or chronic inflammation of the bladder. In these latter instances, when another surgeon is called in consultation, and, seeing the case and hearing the symptoms for the first time, suggests a systematic examination, the detection of the stone often seems to take by surprise the ordinary attendant, who has watched the gradual accession of the ailments, and has attributed them to the concomitant disease of the prostate and bladder. In all cases, then, which present any of the symptoms of stone, I believe that it is the duty of the medical attendant to make periodical systematic examinations of the bladder.

2. The circumstances connected with the patient which make lithotrity doubtful are general debility, stricture, enlarged prostate, atony of the bladder, and chronic cystitis. Any of these conditions would, of course, militate against either form of operation, but some of them are specially unfavourable for lithotrity. Obstinate and long-continued stricture is obviously a great bar to the successful removal of a stone by crushing; but, contrary to what was at one time supposed, atony of the bladder, even with a moderately enlarged prostate, is not to be considered a contraindication. The absence of irritability in this condition is considered by the best lithotritists to afford unusually good opportunities for the employment of a smooth scoop, by which the débris may be removed as rapidly as by the stream of urine in ordinary cases. Chronic cystorrhœa may frequently be improved by a judicious course of treatment; but that condition so frequently depends on the presence of the stone that its removal affords the proper conditions for further improvement.

In cases of very much enfeebled health and exceptionally enlarged prostate, the question is rather whether any operation should be performed at all; but if decided on, the greater safety lies in lithotrity if the stone is small, and lithotomy if the stone is large.

There are few questions which demand a greater exercise of sound judgment than the decision as to whether a patient with stone in the bladder should be advised to submit to operation, in the circumstances referred to in the preceding sentence. There is, on the one hand, the extreme danger of a

fatal result within a few days; on the other, the excruciating agony without hope of mitigation by any other course of treatment. It is not surprising to know that frequently the patient himself prefers the greater danger with the hope of relief to the unending torment with no prospect of abatement. It seems the duty of the surgeon to state the case as fairly as he can, and leave the decision in the hands of his patient, biassing him in one way or the other according to the gravity of the case. Of course there are some instances where no one would agree to operate at all; but these must be very few and exceptional. In many examples on record, the surgeon has undertaken the case as a last resource at the urgent request of the patient, and has had good reason to congratulate himself on the result. This applies equally to both operations, but I refer to it just now in connexion with the question as to what circumstances should deter us from operating at all. In a case which I had lately, where the stone had been in existence, and of considerable size, for many months,—and where there was enlarged prostate, atony of the bladder, chronic cystitis, and enfeebled health,—I felt bound to give a very guarded opinion; but as I could not exclude the hope of recovery, the patient himself elected to have the operation, lithotomy, performed, saying the agony was too great to be endured any longer. In similar instances we are, I think, bound to give the patient the chance of recovery unless in exceptionally bad cases.

I think I have now touched briefly on most of the points of interest which assist us in determining the question of lithotomy or lithotrity in particular examples. I am aware that the discussion of these topics might be extended to almost any length, and I know that they are treated systematically in the standard works on the subject. But I have thought that they might be introduced here in a concise form, so that they may be looked on as the ground on which I believe in many instances in the adult, calculi may be removed with more safety by the crushing than by the cutting operation.

With regard to the pain and suffering during the period of treatment, so much depends on individual constitution that no general conclusion can be drawn. Lately I had two typical cases which made a great impression on many of the students who witnessed the treatment in each case. One was a boy two and a half years of age, from whom I removed a calculus weighing ten grains by the rectangular lithotomy. He made a very perfect recovery, being discharged with the wound completely healed in three weeks after the operation. During the time the wound was open he screamed with pain each time the urine was evacuated, but no untoward symptoms arose. The other case was that of an adult who had a small hard stone. I crushed it on four occasions, at intervals of two days, and he was dismissed perfectly cured, after a fortnight's residence, having been confined to bed only one day during the whole time. Of course this is an unusually fortunate example; still, in most that I have seen, the pain or suffering, where there was any, was limited to the time when the operation was performed, and when excessive, could easily be mitigated by chloroform.

There is one objection to lithotrity frequently urged, which I must notice. It is stated that there is a greater frequency of a return of the disease after the crushing than after the cutting operation. This assumed consequence is attributed to the retention in the bladder of some small fragments that may have eluded the final search of the surgeon, or to an alteration in the lining membrane of the bladder produced by the use of the instruments, which tends to cause phosphatic deposit. But I know of no evidence to support this assumption. I am very unwilling to quote my own experience in this matter, but in the absence of any other, I can do nothing else. I know of two cases in which lithotrity was followed by the formation of another calculus some time after; just such cases as would be quoted in evidence of the above assumption; but in each case the new formation was clearly to be attributed to the constitutional tendency, and not to faulty operation. In one case the stone was formed many years after a small one of a similar nature had been crushed and removed by Sir Benjamin Brodie; and after the second was removed, a third made its appearance two or three years subsequently.

In the other case, a uric calculus was formed two years after the operation of lithotomy, in which two stones were removed. The third one was crushed, and was followed in a year by another; that was followed by another, which was detected when so small that a single manipulation removed it; since which time the patient has not had a symptom. In the May number of the Edinburgh Medical Journal, there is an account of a case in which lithotomy was performed three times at intervals of some years; the calculus being reproduced after complete removal. Until I find evidence to the contrary, I am justified in believing that relapse is not more frequent after well-performed lithotrity than after lithotomy.

But an important method of *preventing* the re-formation of calculus remains to be mentioned, which has been recommended as a part of the after-treatment of lithotrity. I allude to the practice of washing out the bladder with a stream of tepid water. This can be done very effectually by the patient himself, by means of a gum-elastic catheter and india-rubber bag. The water may be made astringent or slightly acid, or alkaline if desired, according to the nature of the case. My experience is too limited to entitle me to give any opinion as to its effects after lithotrity, but in an analogous case the benefit was very striking. A young man with urinary symptoms consulted Dr. J. B. Cowan, who, finding some of the indications of stone, sent him to me. A very careful examination with the sound satisfied Dr. Cowan and myself that there were no calculi. There were occasional slight discharges of blood, just enough to tinge the urine. There was a considerable quantity of mucus and phosphatic sand in the urine; the latter occurring in bits the size of a small pin's head. The patient was ordered a tonic regimen, and advised to wash out his bladder daily with a solution of acetate of lead, one grain to two ounces of water. This he continued for a month with manifest improvement; then the injections were made weekly, and at the end of three months every trace of the former affection had disappeared. I have no doubt that if the precaution referred to had not been adopted, he would have become the subject of a phosphatic calculus in the bladder. The same treatment, I am informed, has been effectual in preventing re-accumulation after phosphatic calculi have been removed by lithotrity; a well known example of which was the case of the late King of the Belgians.—*Edinburgh Medical Journal, July*, 1868, *p.* 6.

66.—ON LITHOTOMY.

By Sir Henry Thompson, Bart.

I now come to the mode of performing the lateral and the medio-bilateral operations, and will give a few general hints which will apply equally to either. As I have said before, when we have to do with many details, let us try to revert to first principles, and define clearly the object we aim at. I told you that the object of lithotrity is to remove the stone without injury to the patient either from the stone or the instrument. In lithotomy you must have a wound, and the object is to make it in such parts as shall least endanger the blood-vessels, the viscera, or the neck of the bladder, and to remove the stone through the lower outlet of the pelvis with as little mischief as possible to any of those parts. When that problem is best solved we shall have the best form of lithotomy.

Now, in order to aid you to solve the problem for yourselves, I have placed before you a diagram drawn accurately from the preparation, showing the bones and ligaments of the pelvis, in the position for lithotomy. The lower outlet is opposite to us; it is in the patient filled by soft parts, and it is the opening into which you have to cut, and through which you must remove the stone, and in all that you do, you must be limited by its boundaries of bone. I like to have that in my mind's eye when the patient is tied up and I take my seat to operate. Here also are diagrams, showing two stages of the dissection of the perineum. I take it for granted that you know your

anatomy too well to require any detailed account here of the important parts involved in the operation. I shall simply name those which concern us. First, there is the pudic artery, safely sheltered under the pubic ramus; but it gives a branch to the bulb, a vessel to be avoided at the upper part of the space. Then in the same part is the bulb of the urethra, which is not to be thought too lightly of; indeed it is the source of some of the chief dangers; it is a vascular expansion from the vessel named, and cutting into it is as bad as cutting into the vessel itself, if not worse. Next there is the rectum in the middle and lower part, which it is also important to avoid. The other diagram shows the position of the prostate, which must be divided in the deep incision.

I will now briefly touch on the principal steps of the operation. The patient's bowels are to be thoroughly emptied by an enema a few hours before. Do not trouble yourself about the quantity of urine in the bladder. Some think it very important that it should be full. Cheselden, on the other hand, preferred it to be empty, saying that in this condition the stone was easily found close to the neck of the bladder.

The first thing the operator does is to pass the staff into the bladder and find the stone. Never think of cutting a man if you are not perfectly satisfied that the staff is in contact with it. Frightful blunders have been made through indifference to this rule. Suppose for example, the staff is in a false passage, and is not in the bladder at all: one shudders at the idea of an operation performed on a staff so placed—an exhibition distressing to all concerned— never to be forgotten either by the operator or the bystander, and probably fatal to the patient. The "click," then, is to be distinctly audible to yourself and to a witness, and the staff is to be put into the hand of your best friend, who is to attend implicitly to your instructions, and to no others, whatever they may be. The patient is then to be tied up firmly; better still if secured by these leather anklets and wristbands, devised by Mr. Pritchard, of Bristol, because they truly realise the proverb "fast bind, safe find," which our old friends the garters often did not.

Now, what are the instructions to your friend the staff-holder? You want it held firmly, and, of all things not to leave the bladder. I don't think you will gain much by cultivating a fancy for any particular spot, such as right or left, or projecting in the perineum. If it is to be steady and in one spot, which is the main thing, there must be a point of support for it to rest against and there is but one such spot in the whole region. Rely upon it, then, you had better tell him to keep it close to the arch of the pubes, well hooked up, with the handle pretty nearly vertical. Your fingers now traverse the region and find the lines of the rami, also the condition of the bowel, whether empty and contracted, or the reverse.

Now, relative to the first incision, different authorities advise different places at which to enter the scalpel and commence. Without discussing these, let me say that as a rule, the usual spot should be, for an adult, an inch or an inch and a quarter in front of the anus, a little on the left side of the raphé. Go in boldly, slightly pointing upwards, near to or into the staff, and then gradually less deeply till you come out about three inches lower down towards the inner side of the tuber ischii. It is very pleasant to feel that you touch the staff in that first incision, and it saves trouble and uncertainty to have gone close to it, which you always ought to do; never let it be a timid, shallow cut, merely dividing the skin. The left index-finger follows, and should feel the staff easily through the tissues. Fixing the finger-nail upon it, the point of the knife is fixed firmly in the groove, and is run steadily on in contact with the staff. Keep the point up and you will be safe; let it down and you may slip out and get into the rectum, or nobody knows where. Simply go on, letting the blade be a little more horizontal as it proceeds. Go on till you are well into the bladder, not letting the point leave the staff. The depth of the incision will depend upon the angle which the knife makes with the staff; if you withdraw with the knife close to the staff, of course you will only make a wound the width of the knife; and if the edge is directed outwards and downwards against the soft parts, with a light

hand as you come out, you will make a freer and cleaner opening. It is better to be rather free in cutting than otherwise [the presence of a large stone is assumed], but you must not make the incision too wide. There has been a great deal of good advice expended about this subject, the depth of the incision, but it is manifestly impossible for one man to make another understand what he means or what he does by any amount of talk. My belief is, however, that the result of our anxious care about this matter is, practically, that we are apt to cut rather too niggardly than too freely, and the neck of the bladder, in consequence, receives severer injury from the stone and forceps than it otherwise would receive from the knife. This relates of course to adults; for in children you can scarcely find the prostate —it weighs but a few grains, and does not come in for a moment's consideration, and your knife goes far beyond its limits; yet these little patients are the safest to cut. Of course there is a very great difference in the two ages, due to the different conditions of puberty and childhood. To return. The incision being completed, your left index-finger immediately follows close along the staff into the bladder, where you will probably just touch the stone. The finger goes firmly and deeply in, stopping the urine perhaps to some extent in its outflow, and accomplishing some dilatation of the parts. Then you slide the forceps closely along the palmar surface of the finger, and insinuate them into the bladder, which makes dilatation No. 2. Then, generally speaking, you have but to open the instrument carefully, yet widely, one blade flat at the bottom of the bladder, the other towards the top, and, closing the blades, the stone is probably between them. If it seems that you have a good hold, draw gradually outwards and downwards, easing or adjusting, if you can, with the left index; and so you make the third and last dilatation. Remember not to pull out horizontally and bruise the parts against the pubic arch, but downwards into the widest part of the lower pelvic aperture. [Diagram.] And don't be hurried for the sake of anybody else. You and your patient are to be, for you, at this moment, the only persons present, and your responsibility to him must never be forgotten for an instant through the influence of bystanders and lookers on.

I must now briefly add that you will search for a second stone, tie any vessel spouting within sight, insert the tube into the bladder, and stuff the wound round it if the hemorrhage is free. The patient is placed in bed on his back, with one or two pillows under each ham, and the parts involved exposed to air and light, so that you see how the urine flows. The less meddling afterwards generally the better.

I have only time to say a word or two about the median and medio-bilateral operations. For the median, an incision is made in the line of the raphé from about two inches and a half above the anus, downwards or near to its margin as is safe, for you want all the space you can get. Dissecting down to the staff, with a finger in the rectum, and opening the urethra in the membranous portion or thereabout, you carry a director on into the bladder; your finger follows, and dilates, and then the forceps on that. Manifestly this will not do for large stones, which mainly, thanks to lithotrity, are what we have to deal with now. Hence the applicability of the "median" is extended by making it "medio-bilateral," and in this manner. Having performed the median, as just described, up to the joint of opening the urethra, instead of introducing a director, you introduce the two-bladed lithotome, and when it is in the bladder you open the blades, and two moderate incisions are made, one right, the other left, as you draw the opened instrument outwards in the groove of the staff. These two operations I have now performed about thirty times, and I do not know, after all, that there is much to choose between them and the old "lateral." To make an accurate estimate, one requires at least 100 cases of each operation by the same hand. Nevertheless, I may say a word, finally, on the principle which essentially distinguishes these operations. They are the result of opposite convictions respecting the hazard of the knife. There is a set of men to whom anatomy is a bugbear, and who are afraid of cutting as much as is absolutely necessary; and there are other men less timid—mind, I don't say less cautious,—who regard the

larger, freer style of operating as better than the small or fearful style. All surgeons, of course, tend more or less to fall into one of these two classes. The anatomical school have devised a variety of median operations in order to avoid certain blood-vessels, &c., and they sacrifice space in doing so. They answer excellently well for small and medium-sized stones; but these are or should be crushed now, and we do not want any operation for such stones. The perineal operation which offers the most room, the recto-vesical excepted, is the lateral operation. All the others named are essentially median operations. Now I am bound to say that formerly, judging theoretically, I had a leaning to the median method, being disposed to think that it would be attended with less hemorrhage than the others. But I do not find this so in practice, and I have arrived at the conclusion that there is quite as much bleeding as in the lateral operation. I attribute this to the bulb. I regard the bulb as a large artery to all intents and purposes. You cut into that spongy tissue—not in all cases but in some,—and there is as much bleeding as if you cut the artery of the bulb, and more difficulty in controlling it. The bulb must be cut more or less in the median operation. The problem is how to get into the bladder without wounding the bulb, its artery, and the rectum; and I believe that a well-performed lateral operation accomplishes this, where a free opening for a large stone is required, better than any other.—*Lancet, June* 6, 1868, *p.* 709.

67.—ON SOME RECENT IMPROVEMENTS IN THE OPERATION OF LITHOTOMY.

By Dr. Andrew Buchanan, Glasgow.

[The following article which was published as a letter addressed to the editor of the Lancet, was elicited by that of Mr. Hutchinson, contained in our last volume of the *Retrospect*, p. 236.]

The idea of confining the section both of the external parts and of the prostate gland to the mesial plane in front of the rectum was shown by Dupuytren more than half a century ago to be utterly impracticable for all stones of ordinary magnitude; and yet this operation, under the ambiguous generic name of "median" (proper specific name, medio-vertical), has been for some years past occupying simple minds in this country as something quite novel, and big with vast results.

The mesial plane enables us to penetrate by the best road into the bladder, and this constitutes the distinctive character of the "mesial" or "median" operations in contradistinction to the lateral, where the knife penetrates inward from the side of the perineum. But to extract a stone of ordinary size we must also make a lateral section both of the prostate gland and of the external parts on one or both sides (medio-lateral and medio-bilateral operations). Now comes the most important question of all. Which of all these operations is the safest, or that attended with the least average mortality? Is it one of the median operations: the medio-lateral, the medio bilateral, or the medio-vertical; or does the advantage lie with the old lateral operation? The question can only be answered by referring to the recorded results of these different operations. We may put out of the competition the medio-vertical as too restricted in its range. The medio-bilateral was, as I stated in my last letter, in the hands of its author, an unfortunate operation in its results. It only remains, therefore, to compare the medio-lateral and the old lateral operations. With respect to the latter I referred in my last in an especial manner to Sir William Fergusson, in the hope of drawing from him the most recent statistics of the lateral operation, which he seems never weary of extolling to his applauding students as superior to every other. Having failed in my object, I refer to Sir William's published work on Surgery, in which he states that the highest average of success in the hands of Cheselden and other great operators whom he enumerates, has been one death in five, six, seven, or eight. Now in the medio-lateral operation, which I recommend, there is ample evidence to show that the average mor-

tality from all operations, by whomsoever performed, is not more than one in twelve, while in the practised hands of my young friends, Dr. George Macleod, Dr. Eben. Watson, and Dr. George Buchanan, a still higher degree of security has been attained. These are surely recommendations that might induce even a surgeon to a metropolitan hospital to try the operation, although I am aware that it has to contend with the good old English prejudice against everything which comes from the country of John Hunter.—*Lancet, June 27, 1868, p.* 831.

68.—ON CYSTITIS AND PROSTATITIS.

By Sir Henry Thompson.

[The chronic form of cystitis is that which most requires our attention, and in treatment most care and judgment. In the simpler, there is little else than some increase of the natural mucus from the bladder mixed with the urine. In the other form the mucus is very tenacious, and acquires a thick viscid character on standing. The most common cause of this is inability of the bladder, either from atony of its coats or from prostatic obstruction, to empty its contents; yet it does by no means necessarily occur in these circumstances.]

With regard to the treatment, the first thing is to take care that the bladder is emptied by a catheter once, twice, or three times a day, in the easiest manner possible, of which I treated in the fourth lecture. And this is necessary because decomposing urine is a great source of irritation to the mucous membrane. The urea contained in the secretion which enters by the ureters in a healthy state is soon decomposed into carbonate of ammonia, and the ammoniacal salt is an acrid and irritating substance. You explain to your patient that his bladder, not having been emptied for many months perhaps, has acquired somewhat the condition which a badly washed utensil would have done in like circumstances—a useful and sufficiently accurate illustration for the lay understanding, and he will appreciate it when he finds, as he probably will, that the mucus diminishes considerably after a few days of this treatment. But suppose it does not do so, or does so but slightly, what then? I will tell you what sometimes happens, and I am not sure that the fact I am about to ask your attention to has been observed or recorded. It is this: *you cannot completely empty every bladder with the catheter.* When the prostate is irregular in shape and throws out protuberances into the bladder, there are sinuses or spaces between them, which retain one, two, or even more drachms of urine. Again, there are not unfrequently numerous small sacculi in the coats of the bladder which act in the same way. When obstruction at the neck has existed some time, the daily straining, although not considerable, necessary to expel the urine produces hypertrophy of the muscular bands which form that coat of the bladder. Now you know hydraulic pressure is equal in every direction, and in course of time the expulsive act gradually forces the mucous lining between the interlacing muscular bands, and little pouches result. In these it is not uncommon for calculi to be secreted, and thus in time encysted calculus is formed. In any case, however, those pouches become receptacles of urine, which become stale, and irritating in consequence. Now the mere withdrawal of the urine by catheter by no means empties the reservoir in these circumstances, and enough of noxious fluid is left therein to maintain the unhealthy condition of its lining membrane. What you have to do is to wash out the bladder at least once a day with a little warm water before you remove the catheter. I am very particular indeed as to the manner of doing this. Washing out the bladder may be a very valuable mode of treatment, or a mere contrivance for seriously irritating that organ, according to the mode in which it is performed. A common mode, indeed that which I always saw employed some years ago, was to attach to the catheter (which was often of silver, and it is unnecessary to repeat my views about that) a large metal syringe, and to throw in with considerable force six or eight ounces of water. I wish you to cherish a wholesome horror of that proceeding; and in no case can it be necessary. A healthy bladder, and

much more a tender one, can only be disturbed and pained by such a process. This sensitive organ is only accustomed to be distended gradually by the continued percolation into it of urine from the kidneys. Let your washing-out at least conform in some respect to that process. Never, under any circumstances, throw in more than two ounces; and even this quantity, for efficient washing, is better avoided. Proceed then as follows:—You have a flexible catheter in the bladder; have ready a four-ounce india-rubber bottle with a brass nozzle and stop-cock, the nozzle long and tapering so as to fit a catheter of any size between Nos. 5 and 10, filled with warm water—say at 100° Fahr. Attach the nozzle gently to the catheter, and throw in slowly a fourth of its contents; let that run out, and it will be thick and dirty, no doubt; then inject another fourth, which will be less so; again another, which will return clearer than the preceding; and the fourth portion will probably come away nearly clear. Now these four separate washings, of an ounce each, will have been really more efficient than two washings of four ounces each; and you will, in obedience to my never-failing injunction, have reduced the amount of instrumental irritation to a minimum. Ten to one but the patient will regard your performance as soothing to his feelings. There are other methods of effecting the object, but this is the *principle* I want you to understand; and the mode of carrying it out which I have described is one of the simplest.

What if this washing-out has not accomplished all we wish? We may then, and often with great advantage, try medicated injections. Perhaps the best mild astringent, when the urine is alkaline and depositing phosphates, is the acetate of lead, in the proportion of one grain to four ounces of warm water, not stronger; to be used once a day. After this comes the dilute nitric acid; one or two minims to the ounce of water. Then you may try nitrate of silver in small quantity, certainly not more than one grain to four ounces to begin with, going up to about half a grain, or one grain at most, to the ounce. You may also use, especially where the urine is offensive, carbolic acid; one or two minims to four ounces is quite strong enough. Then there is a soothing injection well worth your remembering—viz., biborate of soda and glycerine. It may be used where there is no great indication for an astringent, or it may be combined with one. The value of this for sore mouth suggested to me its use for an irritable bladder, and experience has confirmed my expectation. Here is my formula: Two ounces of glycerine will hold in solution one ounce of biborate of soda; to this add two ounces of water. Let this be the solution, of which you add two or three teaspoonfuls to four ounces of warm water. I arrange all these solutions for four ounces because the four-ounce india-rubber injecting bottle already described is a convenient and portable instrument.

In circumstances of great pain you may inject anodynes into the bladder if you please; but they are of little value. And you need not be afraid of the quantity; for the mucous membrane of the bladder appears to have no absorbing power, unlike the neighbouring tissue which lines the rectum. And there, indeed, is your place for action, if spasm and pain greatly disturb the patient; a suppository of cocoa-nut butter, containing from half a grain to a grain of morphia, is often of the greatest service. Counter-irritants play a small part among our remedies; perhaps the best and safest is a hot linseed poultice, well sprinkled with strong flour of mustard, above the pubes. I cannot say much for croton oil, nitrate of silver, &c., there. Hot fomentations, in the form of bran bags, hot flannels, &c., alleviate pain materially; so also hot hip-baths and the hot bidet.

Then there is a host of infusions and decoctions reputed to exercise a beneficial influence in cystitis. I will name some of them in what I think to be about the order of their value for the cases one commonly meets with:—Buchu, Triticum repens, Alchimella arvensis, Pareira brava, and Uva ursi. Now, for the doses of these, your conventional tablespoon is a miserably inefficient measure. Of the first, fourth, and fifth give half a pint daily; of the second and third, a pint—that is of their infusions or decoctions, as the case may be.

The underground stem of the Triticum repens, or the common couch grass, was introduced some years ago by myself. Of this I will only say that it maintains its credit, and is undoubtedly very useful in many cases. For use, boil two ounces in one pint of water for a quarter of an hour; the strained liquor to be taken by the patient in four doses in the twenty-four hours. It was a favourite remedy in the old herbals; and it formed the staple medicine against what was called "strangury," which, a few centuries ago, meant everything like pain or difficulty in making water, no matter what the cause; for the art of diagnosis then was in its earliest infancy. The Alchimella arvensis, or "Parsley piert" (derived from "percer la pierre," and not a parsley or umbelliferous plant at all), has proved in my experience an admirable remedy in obscure cases. Use it as an infusion; one ounce to the pint. Besides these there are the resins, which have a certain amount of influence upon the mucous membrane of the bladder—such, for instance, as copaiba, Venice turpentine, &c. You should not, however, give the dose which you would give in gonorrhœa. Five minims of copaiba, three or four times a day in mucilage, often answers well. I may say the same of the oil of cubebs.

One word about alkalies. As a rule, no doubt, alkalies, in neutralising highly-acid urine, help to control chronic cystitis; and I like the liquor potassæ, as well as the bicarbonates, tartrates, and citrates, which appear to have more diuretic action, and to increase the quantity of urine, when you would rather avoid this action and lessen the frequency of micturition. The old combination of liquor potassæ and henbane, affirmed to be a union of incompatibles, nevertheless seems to me about the most valuable form in practice. I have no doubt that it is quite correct that both henbane and belladonna are deprived of their specific activities when mixed with liquor potassæ. Chemically I dare say that is so. But I am perfectly satisfied that this combination materially controls painful and frequent micturition in the complaint we are considering. Hence I have of late gone back to it, and for the reasons stated.

Now as to acids. Remember that these are by no means the complement of alkalies in relation to the urine. Beware of the popular notion that it is possible to produce an acid reaction on urine by giving mineral acids by the mouth. By giving alkalies you can make the urine neutral or alkaline to any extent you please, but you cannot do the converse with these acids. Yet I constantly hear it said, "The patient's urine is very alkaline; had we not better order acids?" My reply is, "By all means; give an ounce or two daily if you like, but it will not change the reaction of the urine." I have given these quantities, greatly diluted, of course, without the slightest effect on alkaline urine. No doubt mineral acids are useful in giving tone, and so do good; but don't prescribe them with the view of acting on the urine. The acids that do act on the urine are benzoic acid and citric acid, but you have to give so much of these that I do not know whether the remedy is not mostly worse than the disease. The benzoic acid, having some balsamic character, may be useful in some cases of chronic cystitis. The best way to give it is in pills, as it is not soluble in water. Three or four grains, with one drop of glycerine, is a good form; and you must give as many as ten or twelve pills a day if you want to do any good. At all events, it is of no use giving less than six; that would be twenty-four grains in the day. Lemon-juice has also an acid influence on the urine, and if it agrees with the stomach, may be taken in large quantity. But here is the important fact for you to remember. Surplus of acid in the urine is a constitutional error, and it enters the urinary passages at the kidney. It requires constitutional treatment, of the digestive rather than of the excretory organs, and mere alkaline treatment does but mask the acid, does not cure it. You have to remodel the patient's habits, control his diet, and take care that his liver and bowels act healthily and freely. On the other hand persistent alkali in the urine is, in nineteen cases out of twenty, a *local* formation in the bladder. It requires local treatment, as by catheter and injecting-bottle, and not physic. Now and then you have alkaline urine, milky-looking, with amorphous phosphates, as

a constitutional condition; but this is rare, as compared with the cases I am now describing.

I shall close this lecture with some brief remarks on acute and chronic prostatitis.

Acute prostatitis occurs in different degrees of severity, and often comes first before the practitioner's notice when it causes retention of urine by obstructing the neck of the bladder. How this emergency is to be met I have described at some length in the fifth lecture. The organ is often considerably swollen and very tender, and the inflammation may give rise to abscess in the substance of the gland, or adjacent to it; and the matter may burst either into the urethra, its most common course, or into the rectum.

Chronic inflammation of the urethra passing through the prostate, and more or less affecting the prostate itself, is a condition less generally known or recognised. Nevertheless it is a common and important affection. We see it frequently, not always, as the result of obstinate gonorrhœa. I have already referred to it as the cause of symptoms resembling, more than any other malady, those of calculus in the bladder when mild in degree. Thus a patient of twenty or thirty years of age tells you that the following symptoms have rather gradually appeared:—under frequency of micturition; pain following the act, and felt in the end of the penis; occasionally a little blood seen with the last few drops of urine, which may be a little cloudy with muco-purulent deposit; a sense of heat and weight in the perineum and rectum; there is, perhaps, also some gleety discharge in the urethra; and all these conditions aggravated by exercise. You see he gives you a complete sketch of the symptoms of calculus; and how are you to distinguish them? By the history and by sounding. Thus, there is no history of the descent of calculus from the kidney, nor of gravel previously passed. But there is the fact of a chronic gonorrhœa resisting, perhaps, months of treatment. And if the patient shows no improvement you must not decline to sound him. You do so, and find nothing, but that the prostatic urethra was very sensitive; and you make him a little worse, perhaps, for a time.

What is to be done? First and foremost, as a rule, abjure all instruments, which, in most cases, can only do mischief. Treat it as you would a chronic inflammation of the ear or eye—*i. e.*, blister an adjacent surface; make a small blister every four or five days on either side of the raphé of the perineum, by applying with a brush the lin. epispast. of the Pharmacopœia, not so freely as to distress him or prevent locomotion, and keep it up for four or six weeks. I have found the best results from this method, combined with a tonic medicine and regimen, and you will find the patient himself gladly exchanging the dull, weary aching in the perineum for the smart of the blister, and cheerfully noticing how the former gradually subsides under the influence of the latter. In exceptional cases, where chronic gleet is a prominent symptom, the application of a solution of nitrate of silver, not more than five or ten grains to the ounce of water, to the prostatic urethra, may be very serviceable.—*Lancet*, *June* 20, 1868, *p.* 775.

69.—ON HÆMATURIA AND RENAL CALCULUS.

By Sir Henry Thompson, Surgeon to University College Hospital.

[Hæmaturia is the outflow of urine mixed with blood. Thus, bleeding from the penis at other times than at that of micturition is, of course, not hæmaturia. Hæmaturia, then, is a symptom, and it is a matter for diagnosis to determine what it is a symptom of.]

When you see a specimen of urine containing blood, you will, as a matter of course, make a rough mental note of the proportion of blood present, and you will mark the colour. And as you can count on your fingers the ordinary sources of blood, these will pass rapidly in review at the same time. Let us name them as follows:—

1. The kidneys, where it may be from diseased action, more or less tem

porary, as inflammation; or from disease more or less persisting, as degeneration of structure; or from mechanical injury, as from calculus there, or by a strain, or a blow on the back. If the hæmaturia is the result of inflammation, there will be general fever denoting its presence; if produced by slow organic change, there will be the history of failing health, and probably urine changed in quality otherwise than by the mere admixture of blood. Where blood is in very small quantity, as it will naturally be at times, note the character of the urine proper—whether of low specific gravity, pale, with albumen in greater proportion than blood or pus will account for; perhaps renal casts may be found; and look out for dropsies in any degree. In both the preceding forms, if blood is present it will give the smoke tint to the secretion. Perhaps it may be affirmed that such urine, associated with very little if any local pain, is more likely to come from the kidney than elsewhere. In malignant renal tumour blood may be large in quantity at times: the rapidity of growth, and the size attained, are the marked characteristics of the disease. If mechanical injury be the origin of hæmaturia, there will be the history of a blow or strain; or there may be the signs and symptoms of renal calculus, of which more detail presently.

2. Then, putting aside the ureters, you will remember the bladder as the second source of hemorrhage; and here it may be due to some acute cystitis, stone, or tumour. The former is obvious enough from muco-pus in the urine, and through other signs; while the second may well be suspected by the symptoms, and its presence realised by the sound. Here the hemorrhage is usually florid, and in proportion to the patient's movements. But the third condition—namely, that the hemorrhage arises from tumour—is not always so readily to be affirmed. As a rule, however, blood from such a source is larger in quantity than from stone, and may be associated with less of muco-pus. If the tumour is malignant, it may be felt, and the pain is often severe; if villous, it gives an even pale-red tint for days together to the urine; and in both cases the blood is florid, unless it is long retained in the bladder, when dark sanies, like coffee-grounds, results.

3. In hemorrhage from the prostate, the third principal locality or source, the same thing occurs, if the organ is hypertrophied and the blood is retained; but here the age of the patient, and the ascertained condition of the organ from the bowel, aid the diagnosis. A slight appearance of blood mixed with the last few drops of urine is not a rare occurrence in chronic prostatitis.

4. When bleeding arises from stricture of the urethra, the patient's history and the cause of the bleeding, almost always instrumental, leave no room for doubt. From the use of instruments also in the bladder hemorrhage sometimes arises. Then it is not to be forgotten that occasionally blood is found in the urine as the result of violent diuretics, from purpura, in fevers, and in a hemorrhagic diathesis.

Now for the treatment of hemorrhage. When you have determined that its source is above the bladder—that is, in the kidney or in its pelvis, probably the first and most influential remedial agent is rest in the recumbent position. Whether from a lesion affecting the intimate structure, or from the mechanical irritation of a calculus in any part of the organ, rest is the first and the essential condition. The patient is, moreover, to be maintained in as cool and as tranquil a state as possible.

It is in renal more than in any other form of hæmaturia, perhaps, that direct or internal astringents or styptics are useful. I shall do no more than name those which are most commonly used—namely, gallic and tannic acids; lead and turpentine; equal to them is, I think, the infusion of matico, say in doses of two ounces every two or three hours. The tincture of iron and also sulphuric acid may sometimes be taken with advantage.

It is, however, in cases of severe hemorrhage from the bladder, or more commonly from an enlarged prostate, that active and judicious treatment is necessary. You will be called sometimes to a patient whose bladder is distended with coagulated blood, or who is passing frequently a quantity of fluid in which blood is the predominating element. Usually this has arisen

from some injury inflicted by the instrument, although it may also be from tumour of the vesical walls. Here you will keep the patient on his back, and forbid the upright position, or any straining, so far as you can prevent it, in passing water. To this end give opium liberally, to subdue the painful and continued action of the bladder. Apply cold by means of bags of ice to the perineum and above the pubes. Better still, introduce small pieces of ice into the rectum. Do not use an instrument if it is possible to do without it. There is a great dread in some people's minds about the existence of a large coagulum in the bladder. I have even known a bladder to be opened above the pubes by the surgeon for the mere purpose of evacuating a mass of clotted blood. Leave it alone; it will gradually be dissolved and got rid of by the continued action of the urine; while if you are in haste to interfere, and are very successful in removing it, you will succeed also most probably in setting up fresh hemorrhage. The bleeding vessels have a far better chance of closing effectually if they are not subjected to mechanical interference. Meanwhile, support the patient's powers by good broths, &c.

But it sometimes happens that hemorrhage occurs in a patient who has long lost all power of passing urine except by catheter. This is a very different position. Here the coagulated mass which fills the bladder must sometimes be removed, or no urine can be brought away. Thus, you introduce a catheter and none appears, for the end of the instrument passes into a mass of coagulum, and nothing can issue. Sometimes sufficient may be removed by attaching to a large silver catheter a six-ounce syringe or a stomach-pump. Clover's lithotrity apparatus has answered remarkably well with me in two or three instances. Let me caution you never to inject styptics into the bladder; the irritation does more harm than good.

In passing to another subject I beg to call your attention to a glass before you containing some urine of a dark and somewhat unnatural tint. Let us interrogate the case of the patient from whom it came. In obtaining this specimen I took care that he should first pass about an ounce into a separate vessel to clear his urethra—a precaution always absolutely necessary to avoid error, as I have before warned you—and the remainder into this. It is less translucent than average healthy urine is, and has a deeper colour. The hue is not red, but slightly orange, with a dirty brownish tint, commonly and very well distinguished by the word "smoky." That tint denotes blood to an ordinarily practised eye. Why is it not red? Because blood after a certain term of contact with urine loses its red colour and becomes brown; and you see it in that condition, or according to the quantity, producing any depth of hue from this up to that of London porter. Put it under the microscope, and you will find plenty of blood-corpuscles. We get this broad principle, then, to start with: bleeding from the more distant parts of the urinary system, unless in very large quantity, will almost certainly make the urine brown, while urine which contains red blood has almost certainly issued recently from some source in the bladder, probably at or near its neck, these being the more common sites of vesical hæmaturia.

In the case before us, then, we proceed easily and rapidly to eliminate many of the sources of bleeding by physical exploration, and by the account which he gives of his sensations. He makes a good stream when a fair amount of urine has accumulated in his bladder, but this does not often happen, for he passes it every two hours or less in the day, not so frequently at night; no straining is necessary. Pain in the course of the urethra is experienced during and after micturition; not severe. He is uneasy about the pelvis and loins on taking exercise, and more blood passes afterwards. He is somewhat emaciated, and so presents a good condition for examination by the hand. He is subject to variation in the intensity of the symptoms, having now and then attacks of a few days' duration, in which they are aggravated, and he dates their commencement in an attack which occurred seven years ago. His age is forty-five years. He has never passed gravel. He is much less robust than formerly; his digestion is not good. A full-sized bougie passes easily into the bladder; no stricture; hypertrophy of prostate at his age not possible. On sounding he is manifestly more tender than

usual; nothing is felt, nor any deviation from the natural condition by simultaneous examination by the rectum. Palpation of lower part of abdomen shows nothing. Arriving close under the last ribs of left side with one hand, the other pressing firmly on left renal region, he flinches unmistakably; that is the spot, he says, where he feels pain at times and on movement: right side nothing. We examine his urine: sp. gr. 1018, acid, small brownish deposit on standing; under microscope, blood-corpuscles, some pus-corpuscles, epithelium, no crystals, no casts; albumen a little; corresponding with organic matters present.

What is the seat of the lesion in his case? Perhaps the bladder: we found it tender to the sound, and it acts with undue frequency. Yet remember this is by no means evidence of any primary morbid change there, such conditions constantly accompanying diseases affecting primarily the kidneys or the upper part of the ureter. Much more probably the kidney. The manifest local tenderness, the repeated attacks, the impaired health, the history, the absence of all the more common causes of cystitis in any form, point to the left kidney as the seat of mischief. The absence of albumen and of renal casts—a fact of not much weight, although their presence is of the utmost importance—lead us to believe him free from organic changes affecting the renal organs. I conclude that his left kidney is the seat of calculus, although he has never passed one, and has at present no crystalline deposit in his urine—a fact by no means essential to the diagnosis; and that this calculus is the source of the blood and pus found in his urine.

It is sometimes not easy to say what kind of calculus exists in these cases, of which this is a fair type. When any calculous matters have been passed which can be examined, or when the crystalline deposit in the urine is constant, the inference is pretty clear. Add to this that the probability in any case is strong in favour of uric acid, from its known frequency of occurrence—taking large numbers, say at least fifteen to one as compared with oxalate of lime.

For treatment: Alkaline diuretics and diuretic vegetable infusions, before named, for a period of time; attention to the digestive functions and to that of the skin, for the kidneys are probably working too much vicariously for some other function acting lazily; moderation in highly nitrogenized food; mild alcoholic drinks, perhaps in most cases permitting only a light and mild Bordeaux. Of all medicinal remedies, perhaps none are so valuable as mineral waters, especially those which have sulphate of soda largely diluted as the main ingredient. Take Carlsbad as a type. For two well-known remedial agents, which are very popular, each among its class, I am bound to tell you I have very small esteem. In town, it seems to me that every man advises his neighbour, and on every pretext, to drink Vichy water—advice which is cheap, and of which the value in most instances by no means exceeds the cost. In the country, where perhaps the fairer sex more usually dispense similar aid to their suffering neighbours, the prescription is mostly gin-and-water. Of the first, or natural product, which is a strong solution of carbonate of soda, I must say that, if not absolutely injurious, it is at least greatly inferior to potash; and of the second, or artificial one, that it is about as serviceable to the kidneys as a pair of spurs is to a jaded horse—makes him travel for a time, but takes it out of him in the long run. For the paroxysms of severe pain which denote the passage of a renal calculus, it must suffice here to name, hot hip-baths with diluents, and anodynes in liberal quantity.

I shall here, by way of episode, refer to a mode of determining the true characters of a patient's urine, which is of extreme value in some doubtful cases—a mode which has never to my knowledge been recommended or practised, and which I have systematised for myself. I have already told you how essential it is to avoid admixture of urethral products with urine, if you desire to have a pure specimen. It is sometimes quite as essential to avoid its admixture with products of the bladder. And I defy you to achieve an absolute diagnosis—by which I mean a demonstration, and never be satisfied with less if it be practicable,—in some few cases, without following

the method in question. When therefore it is essential to my purpose to obtain an absolutely pure specimen of the renal secretion, I pass a soft gum catheter of medium size into the bladder, the patient standing, draw off all the urine, carefully wash out the viscus by repeated small injections of warm water (before shown to be rather soothing than irritating in their influence), and then permit the urine to pass, as it will do, guttatim, into a test tube or other small glass vessel for purposes of examination. The bladder ceases for a time to be a reservoir; it does not expand, but is contracted round the catheter, and the urine percolates from the ureters direct. You have, indeed, virtually just lengthened the ureters as far as to your glass. And now you have a specimen which, for appreciating albumen, for determining reaction, and for freedom from vesical pus and even blood, and from cell growths of vesical origin, is of the greatest value, and has often furnished me with the only data previously wanting to accomplish an exact diagnosis. Mind never to be satisfied to guess at anything; make, very cautiously if you will, your provisional theories about a doubtful case—indeed, the intellectual faculty will do this constantly, and without reference to the will,—but arrive at no conclusion, take no action, except so far as you are warranted by facts.—*Lancet, Aug.* 22, 1868, *p.* 241.

70.—STRICTURE OF THE URETHRA TREATED BY CAUSTICS.

Under the care of Henry Smith, Esq., at King's College Hospital.

The treatment of stricture at the present day resolves itself into three chief methods, each one having its staunch upholders. There is the gradual dilatation of the contracted passage; sudden dilatation, as practised by Mr. Holt, of the Westminster Hospital; and there is the mode of cure, more particularly advocated by Mr. Wade, by the application of caustic to the face of the stricture, causing, first, abatement of the irritability of the urethra; secondly, "actual absorption" of the thickened tissue; and thirdly, and lastly, direct destruction of the thickened walls of the passage. This author states that he has never noticed any slough come away with the urine after caustic has been applied to the stricture, thus leading one to suppose that the potassa fusa does not destroy the tissue with which it comes in contact; but, as Mr. Henry Smith observes in his work on stricture of the urethra, "there is no reason to doubt that it has some destructive agency upon a stricture, knowing, as we do, its powerful effect upon other tissues; and I think the effect which is produced after a free application to a stricture can hardly be explained upon the principle of absorption alone."

The following cases have all three been treated by the last-mentioned method—*i. e.*, caustic (potassa fusa) was applied—and all three have recovered remarkably well; and there seems to be no tendency to return of the constriction in Case No. 1. However, a sufficient time has not elapsed to allow of a verdict. We shall be glad to report the further progress of the cases.

No doubt caustic cannot be used in every case of bad stricture of the urethra, but it appears to be clearly indicated in those cases where there is a great deal of irritability of the urethra; in those cases where only a small catheter can be passed, owing to the "density or irritability" of the stricture; and in those cases, happily very rarely met with, where a long constriction of the passage exists of so irregular and roughened a character as to preclude all hopes of restoring it without having recourse to perineal section.

Case 1.—James R., aged 32, a labourer, living at Isleworth, was admitted into King's College Hospital, August 28, 1867, suffering from severe stricture of the urethra. The man states that twelve months before he applied at the hospital he fell while conducting a team of horses, and was run over by the cart which they were drawing. The wheels passed over the lower part of his abdomen. After this accident he was placed in bed, and next morning found he was unable to pass his urine. A surgeon was sent for, who, by an

instrument, drew off his water, and left the catheter three days in the bladder. From this time the man has had much difficulty in making water, and though on several occasions surgeons have attempted to pass an instrument for his relief, all efforts have been unsuccessful to introduce a catheter into his bladder. When admitted into King's College Hospital, Mr. Henry Smith failed in attempting to push through the stricture the smallest-sized catheter. There was much thickening of the urethra in the region of the perineum, and the patient at times complained of great pain, while the urethra was exceedingly irritable. As no instrument could be passed into the bladder, and as the man was in much pain, several leeches were applied to his perineum, and these gave great relief. The swelling subsided to a considerable extent, and he was able to pass his water in a fuller stream.

August 31. More leeches were applied, and relief afforded.

September 6. Similar treatment, accompanied by similar results.

The excessive sensibility of the urethra having been by this time allayed, Mr. Smith, on September 19, passed a bougie armed with a piece of potassa fusa down to, and applied it to the face of the stricture for half a minute.

September 20. Not so much pain, and stream of water slightly increased in volume.

The potassa fusa was applied in a similar manner, at intervals of two days, up to October 1, when Mr. Smith succeeded in introducing a No. 2 catheter through the stricture and into the bladder.

October 7. Catheter No. 3 passed.

12th. Catheter No. 5 passed.

The man wished much to leave the hospital, and was made an out-patient on October 23, when No. 7 catheter was passed.

The stricture had shown no sign of returning when the man ceased his attendance.

Case 2.—Henry S., aged 40, a stableman, was admitted into the Victoria Ward with stricture of the urethra, April 27, 1868. The man stated that he had gonorrhœa nearly twenty years ago, but that the difficulty in passing his water commenced about seven years since. Instruments had been at various times passed, and two years before applying at King's College he was in another hospital, where he said he underwent the "splitting-up" operation. On admission it was found that he could hardly pass his water at all, in so small a stream did it come. But the urethra was not very irritable, though no catheter could be passed through the stricture.

April 28. A bougie armed with caustic potash was introduced into the urethra, and pressed for a short space against the face of the stricture. Not much pain was felt by the patient at the time, and none afterwards, except when he passed his water.

May 2. The caustic potash was again applied. No pain was felt, but some muco-purulent discharge was caused, which lasted till

May 4, when Mr. H. Smith passed a No. 4 catheter with little trouble. After the introduction of the catheter, a pill of quinine and opium was administered.

May 6. The urethra bled a little after the catheter was passed. No. 6 introduced. Was at this date made an out-patient, as which he has been treated ever since. Now a No. 8 catheter passes easily (June 11).

Case 3.—Thomas R., a lighterman, living at Brentford, was admitted, under Mr. H. Smith, into King's College Hospital on May 7, 1868. The patient stated that he had much difficulty in passing his water for five years, and that some obstruction in the passage had existed long before. Six months since he had been, he said, an inmate of the Westminster Hospital, and was under the care of Mr. Holt, who performed an operation upon him, and greatly relieved him for a time; but the passage gradually contracted again, and on admission into King's College Hospital he could only pass a few drops of urine after violent straining, while at times he had retention.

May 8. As no instrument could be introduced, the caustic potash was applied in the usual manner to the face of the stricture, and a good deal of pain was complained of, both at the time and afterwards, by the patient, but no

bleeding ensued, and tinct. opii ♏xx. given at night made the man quite comfortable.

10th. Potassa fusa again applied. This time there was but little pain accompanying the operation, and none afterwards.

12th. Catheter No. 2 passed without very much difficulty, and without pain.

13th. Catheter No. 4 passed easily.

15th. It was attempted to introduce a No. 5, but the attempt gave so much pain that it was thought advisable to desist, and No. 4 passed readily.

This man has since been attending as an out-patient, and on May 29 No. 7 was introduced, giving no pain. The patient stated that he made water in a "regular good stream."

These three patients were suffering from stricture of so bad a character that no instrument could be passed, and therefore it was deemed advisable to use caustic as an auxiliary to gradual dilatation in the way of cure; but in most instances, without doubt, at least a temporary relief from the affliction can be afforded by the catheter alone. And finally, great caution should be employed in the use of caustic, both in its actual application and also in the selection of the class of cases for which it is necessary.—*Medical Times and Gazette, July* 4, 1868, *p.* 3.

71.—CURIOUS CASE IN WHICH INCONTINENCE OF URINE WAS THE FIRST AND ALMOST THE ONLY SYMPTOM OF PROSTATIC RETENTION WITH SECONDARY DISEASE OF THE KIDNEYS.

By Jonathan Hutchinson, Esq.

[The patient was seen by Mr. Hutchinson only a week before his death. He was 54 years of age. He had suffered for six months from involuntary discharges of urine. It would escape as he was walking in the street, and also in large quantities when asleep in bed. He had no other paralytic symptoms. He could void urine when he wished to do so. Three weeks before his death Dr. Peacock saw him, and advised the use of catheters, and by the first instrument passed a large quantity of urine was drawn off. After this an instrument was passed once a day, and Mr. —— ceased to suffer from incontinence, but also ceased to be able to pass urine voluntarily.]

As I was assured that Mr. —— was rapidly failing in strength, we were obliged to give a very unfavourable prognosis, at the same time we could find nothing to account for his condition. The urine was normal, and he had had no suffering in connection with attacks of retention. Paralysis of the bladder was suggested, yet as soon as the catheter entered the viscus, the stream was expelled with great force. That disease of the prostate should destroy life in so insidious a manner, without cystitis, &c., seemed incomprehensible.

Having got weaker and weaker, Mr. —— at length passed into a heavy, sleepy condition, in which, on Oct. 29th, he died. The autopsy cleared up what of mystery had surrounded his symptoms, and confirmed our conjectures. We found both ureters as large as small intestines, the right kidney a mere bag containing half a pint of fluid, but without any remains of renal tissue, the left kidney much enlarged and inflamed, its cortical structure everywhere infiltrated with grey deposit, its pelvis dilated, and its capsule firmly adherent. Scarcely a portion of healthy kidney structure remained. On seeking for the cause of this in the bladder, we found that organ of large size and with thick fasciculated walls. The prostate was moderately enlarged, and projecting from it into the bladder was an almost pedunculated lobe, the size of one's thumb, which stood up in such a manner that it must have formed a close-fitting valve over the entrance to the urethra, whenever the bladder contracted. This lobe presented a smooth surface, and as it overhung backwards, and had a sloping direction forwards, it would cause no difficulty in the introduction of a catheter.

No doubt the whole kidney mischief was secondary to concealed and un-

suspected retention, and probably this had been going on for long. When the bladder had filled to a certain point, escape was permitted, and probably this was more easy in some positions than in others, as, for instance, the recumbent. Had the existence of this prostatic valve been recognised at an early period in the case, the real remedy would certainly have been either to use catheters regularly, or to establish a permanent fistula above (through the pubes).

The case is a most important instance in proof that passive and quite painless retention of urine may lead to fatal disease in the kidneys, that disease advancing most insidiously, and revealing itself only by the increasing debility of the patient.

Inasmuch as incontinence of urine is well known to be not unfrequently the first symptom of passive retention, it may be well to ask why was it not suspected in this case at an earlier period, and whilst it was possible to have saved the man's life. In answer to this, and in apology for my friends who had charge of him, I must ask the candid reader to remember that the gentleman was walking or riding every day to his business, that the only thing he complained of was that he frequently wet his bed, or lost his urine whilst walking, and that he always asserted that he could make water without difficulty, and that he passed plenty of it. Nothing was more natural than that such symptoms should be mistaken for those of paralysis rather than of retention.

I have seen many cases more or less similar to this, but none exactly like it—none in which the symptoms were so misleading, and in which death was brought about so insidiously. A few years ago, I was one day called to Hemel Hempstead, to see a gentleman who was reported to have cystitis and incontinence of urine. He could pass no urine voluntarily, but his bed was constantly deluged. I had great difficulty in persuading him that his bladder was full; but having at length got permission to use a catheter, drew off an enormous quantity. In him, however, the attack had begun with clear symptoms of painful retention. It was only after sixteen hours of retention that incontinence had occurred.—*Clinical Lectures and Reports of the London Hospital*, 1867-8, *p.* 63.

72.—ON ABSCESS OF THE PROSTATE.—TREATMENT BY PUNCTURE PER RECTUM.

By C. F. Maunder, Esq., Surgeon to the London Hospital.

[Abscess of the prostate is not a common affection. The finger introduced into the rectum will determine the nature of a case. The catheter, on introduction, meets with an obstruction at the prostate, but no attempt should be made to carry it on into the bladder.]

The *objective* or *special* symptom is—a swelling of the prostate, tender and elastic, and perhaps softer at one point than elsewhere where the abscess is pointing. The enlargement may be unilateral in great measure. The diagnosis made, the question of treatment arises. If left to itself an abscess of the prostate will sooner or later break either into the rectum or into the urethra or bladder, or both, rarely through the perineum. If into the bowel it is well, the pus flows in accordance with gravity, and the abscess cavity, under favourable circumstances, rapidly contracts and closes, but if into the urinary passages the abscess cavity is sometimes kept open for a very long time, by reason that urine finds its way into it. The discharge of pus is more or less profuse both during and independently of micturition, which latter is frequent and distressing. Occasionally the spontaneous, or accidental rupture by a catheter of a prostatic abscess into the urethra is attended by quick subsidence of the disease. But on the other hand, before this rupture occurs the patient suffers severely locally, and there is a great deal of constitutional disturbance sometimes; a large quantity of pus is formed, and while time is allowed for spontaneous rupture the gland is being destroyed and a more or less permanent fistulous communication may be established either with the

rectum or urethra, or with both. The timely artificial opening of the abscess cuts short the patient's acute suffering, and will do much to expedite his perfect recovery.

How is a prostatic abscess to be opened? Whether through the perineum, through the rectum, or by forcible catheterism? Not by catheterism, although complete retention of urine exist, because unhappy results similar to spontaneous rupture into the urethra may follow. Puncture through the perineum is recommended by authors, and will certainly effect the desired object, but in this region important structures must be severed by the knife before the abscess can be reached, and the matter is further from the knife than if it be approached by another method, namely, through the rectum.

In the three instances of prostatic abscess which have come under my care before bursting naturally, I opened them through the rectum for certain reasons—the pus seemed to be near the finger, and would flow in accordance with gravity; no important organ could be wounded, and no disagreeable after-consequences were anticipated.

The operation is best performed with a bistouri cache, but in the absence of that instrument a long narrow scalpel protected by adhesive plaster to within half an inch of its point will suffice. This is to be introduced per anum upon and along with the left forefinger, and the prostate is incised at the desired spot. The knife should now be withdrawn and a pair of dressing-forceps closed be introduced and passed into the abscess, when on separating the handles the blades will open, the wound will be enlarged, and the matter will flow. Before incising the prostate the surgeon will ascertain the position of any artery that may be lodged in the wall of the rectum, and will of course avoid wounding it.

Very little after-treatment is necessary beyond rest for a few days; the puncture at once relieving all distressing symptoms.—*Clinical Lectures and Reports of the London Hospital*, 1867-8, *p.* 72.

73.—AN IMPROVED TROCAR AND CANULA FOR PUNCTURING THE BLADDER PER RECTUM.

By John D. Hill, Esq., Surgeon to the Royal Free Hospital.

In surgical practice, cases of retention of urine are sometimes met with which require the operation of puncture of the bladder per rectum, and the retention of the cannla in the bladder until a catheter can be introduced through the urethra. Having had some experience in this form of treatment, I have directed my attention to a defect in the instrument now used, which in some cases is attended with a chance of local mischief, and in all cases with discomfort to the patient.

This instrument is so constructed that the canula is beveled to a sharp edge on the point of the trocar, for the double purpose of allowing it to slide with the trocar through the coats of the bladder without obstruction, and at the same time to spring over the bulb of the trocar by means of a fissure inserted in one or two of its sides. Hence it will be seen that when the trocar is withdrawn, and the bladder emptied, its walls are in actual contact with the sharp edge of the canula. Further, both ends of the canula being always open, the urine trickles away, keeping the patient constantly wet and uncomfortable. To remedy this defect I have lately passed an elastic bougie through the canula, securing it to the outer lip by a piece of tape. Carrying out this principle, Messrs. Weiss and Son have, under my direction, constructed an inner canula, with one end shut and rounded, to project beyond the sharp edge of the outer canula, while the outer end is locked to the lip of the external canula, a small ring being fixed to it as a handle. Thus when the bladder has been relieved by puncture, and the canula secured with tapes, the internal canula is introduced and fixed. By this means the external canula can be retained with perfect safety and comparative comfort, the urine being drawn off as may be required.—*Lancet*, *May* 16, 1868, *p.* 617.

AFFECTIONS OF THE EYE AND EAR.

74.—ON THE USE OF THE OPHTHALMOSCOPE.

By Jonathan Hutchinson, Esq., Surgeon to the London Hospital.

Some of the simplest applications of optics to the observation of the eye, and the detection of diseased conditions, depend upon the fact that the transparent structures still reflect some light, and more when diseased than when healthy. Thus:—

Firstly.—We examine the reflecting efficiency of the surface of the cornea, in order to determine its transparency. In cases in which there is no large opacity, but simply a case of general steaminess caused by an uneven surface, it may be difficult to detect it by direct inspection, but if we expose the eye to the light, and look at the image of the window-frame produced, we shall see directly that this image is blurred and indistinct, like that from a greasy mirror.

Secondly.—We use what is called the catoptric test to determine the presence or absence of the lens. This depends upon the fact that the surfaces of the lens reflect images. Dilate the pupil well with atropia. Hold a small taper in front of the pupil in a dark room. You will observe, if the lens be present, three images: an anterior one, bright, distinct and erect—from the front surface of the cornea; a middle one, inverted, small, fairly distinct—from the concave posterior surface of the lens capsule; a posterior one, erect, indistinct—from the anterior surface of the lens capsule.

Thirdly.—Again, the surfaces of the crystalline lens easily become visible, by the light which they reflect, whenever we can see them obliquely. When the lens is in its normal position it is difficult, unless by oblique illumination, to see its surface; but if it is malplaced, as we sometimes find it, by congenital imperfection, or from injuries, then its surfaces, being oblique, become easily visible. Any one not aware of this fact would at once declare that the malplaced lens was also slightly opaque, and erroneous observations to that effect are to be found in some records of such cases.

In former days the catoptric test used to be much employed to determine the transparency, or otherwise, of the crystalline lens. Now, however, it has been wholly superseded by another discovery, which in its every-day usefulness is second only to that of the ophthalmoscope itself. I allude to oblique illumination. To accomplish this is the easiest matter possible, and by its aid any one of the slightest skill can, in almost all cases, determine at a glance the condition of the patient's pupil and of his crystalline lens. The smallest dots of pigment on the capsule, the least possible streaks of an incipient cataract, become by its aid conspicuously definite. We have no longer any need for the curious, but very disappointing, catoptric test (which fails us just when most needed, *i. e.*, in slight cases; for the discovery of cataract, in any stage whatever, is now perfectly easy. For oblique illumination you need only a candle and a convex lens, say a two-inch. The pupil should be dilated with atropia, and the candle having been placed to one side the patient's head, the lens is held so as to receive its light, and concentrate it to a pencil, which is thrown upon the patient's eye. All the superficial parts, *i. e.*, the cornea, the iris, the pupil, and the lens, may thus be brilliantly lighted up. In addition to the illumination, we may also, with another lens, employ magnifying power, and thus inspect the state of things yet more accurately.

Oblique illumination is applicable to all morbid conditions of the cornea, iris, or lens, and to blood-clots in the anterior part of the vitreous or new growths which bulge forwards into the anterior half of the globe. You cannot, however, by its aid, see the fundus of the eye. To do this we must employ another instrument. Here let us ask the important question, Why is an ophthalmoscope necessary? Why can we not, by simply looking into the little round box, one inch deep, which constitutes an eyeball, see what is at its bottom? The answer is, that the eyeball is not simply a box, it is an

optical instrument, and it is from its lens apparatus that the difficulty comes. The rays of light received by the eye are brought to a focus in the retina; back again from the retina they are reflected, and pass out of the eye, destined to depict somewhere an image of the retina itself. The lens apparatus, however, not only brings the rays passing in to a certain and definite focus on the retina, but it acts on those which pass back, and brings these also to a focus at a certain and definite place. There is no difficulty whatever in illuminating the fundus, any light held in front of the eye will do that, nor have the structures of the fundus any difficulty in reflecting light by which they themselves ought in turn to become visible. The difficulty is in bringing the eye of the observer into the line of the reflected rays; this without artificial aid is impossible, and hence the necessity for the ophthalmoscope.

I have said that every lens has a principal focus, or spot at which parallel rays which impinge upon it are made to meet by the convergence induced. Now, suppose that from this focus the rays are reflected back again, they must pass through the lens in the reverse direction, and will again become parallel. If, however, divergent rays be used, they will in returning be converged and made to meet at another focus in front of it. Inasmuch as the rays were at first not parallel but divergent, the focus at which, after passing through the lens, they meet, will not be at the same distance as that for parallel rays, but at a greater one. The distance will always be in exact proportion to the degree of divergence, and thus the two foci will always bear mutual relations to each other. If one be brought nearer to the lens the other will be further off, and *vice versâ*. Let us call them from this fact, that they maintain mutual relation, "*conjugate foci*." You may observe, if you like, that although conjugate, they keep each other at a distance. It is absolutely necessary that you should observe that all the rays of light passing out from the eye take a direction towards this conjugate focus, and that thus an observer who would make use of them to see the fundus must bring his eye into their line. This line, however, is the same that the rays took in passing into the eye, and if you try to intercept those coming out, you will intercept those going in and cut off the source of illumination.

Thus if we hold a candle two feet in front of the observed eye, its rays, divergent, will be refracted in entering the eye, and will depict an image on the retina—they will then be reflected and again refracted in such a manner that an image of the fundus will be found at the position of the candle flame, that being the position of the conjugate focus. If the observer puts his head in the direction of these rays between the candle and the observed eye, of course he stops the rays which should have entered from the candle, he illuminates only the outside of his own head, and the eye of his patient is left in shadow. If he tries to see by looking from beyond the candle, then the flame of the latter intercepts his view and dazzles his eye. What is wanted is some contrivance to enable the observer to bring his head into his own light. Now the mirror of the ophthalmoscope does this, a reflecting surface with a small hole in the middle, it practically makes the observer's eye the source of illumination, and brings it into the direction which the rays of light returning to their conjugate focus must take. Foreshadowed by Cumming, invented by Helmholtz, improved by Coccius, Reute, Liebreich, and many others, this little instrument, which has worked such a revolution in ophthalmic science, is thus simple in its essential principle.

The ophthalmoscope as in daily use, consists of two parts, a mirror and an object lens, and to these is often added an eye-piece as well. The mirror, however, is the essential, the other parts are accessories intended for different special purposes. Without troubling you with details respecting the various modifications of the instrument, I will now describe the use of the simplest of them—a reflecting mirror slightly concave, and with a perforation in its centre.

Having placed the patient's head in such a manner that the light (a lamp, candle, or gas-light) is on a level with his temple, and slightly behind it, and his face, as a consequence, in shadow, the observer sits in front and applies the ophthalmoscope mirror to his own eye. He should keep both eyes open

that he may see where the light falls, and then move the mirror until the light falls full on the pupil of his patient. In a moment he will perceive the first fact which this instrument reveals, that the fundus is not black, as it has always appeared to be before, but that it is of a brilliant fire-red. He will, however, see nothing of the fundus distinctly, only a general red reflex. Now at this point the student must stop awhile and use his mirror, to inspect first, the transparency of the cornea, and next, that of the lens and vitreous, and to do this he must make the patient move his eye in various directions. After a little practice he will be able to manage his light well, and to throw it with precision wherever he may wish, and to keep it steadily on any given part. At a first lesson he may even, with advantage, practice for awhile where it is rumoured that some end, by illuminating the second button of the patient's waistcoat. Tact in directing the light having been obtained, we may now proceed further. Instruct the patient to look, not full in your face, but over one shoulder; if you are inspecting his *right* eye over your *left* shoulder. You will, when he does this, notice at once that the tint of the light reflected from his fundus is changed, that it is no longer fire-red but canary-yellow. The reason of this is that a different part of the fundus is exposed to view, that, namely, of the optic disc itself, which is much lighter in colour than the rest. The area of yellow is very large—occupies, indeed, the whole of the field, while we know that the disc itself is very small. This proves that the objects thus indistinctly seen are immensely magnified. Magnified by what? By the patient's own eye which, as we have said, is equivalent to a lens of one-inch focus.

Hitherto, we have seen nothing distinctly, but if the observer now brings his head very close to his patient's face, he will be able with more or less facility to observe the details at the bottom of the eye, the trunks of vessels of the retina, the optic disc, &c., &c. All these will be seen very large indeed, being still magnified by the patient's eye. What he sees now is equivalent to type looked at through a one-inch lens, placed exactly one inch in front of it.

[It is plain, then, that we cannot see the fundus of the eye without optical aid. Of such aid, we have our choice of the inverted and of the erect. Both are seen much magnified, the latter much more so than the former. For ordinary purposes the inverted image is used. It is seen very easily, and it brings a large field into view at once, so rendering the observer much less liable to inconvenience from slight motions of the patient's head. The examination of the erect image is chiefly useful for the inspection of detail, and even for these it requires great practice.]

Next I will attempt a few suggestions by which beginners, and those who use the instrument but seldom, may best hope to avoid mistakes.

1. Always indulge yourself in the use of atropine, and by its aid both enlarge the patient's pupil and paralyse his accommodation. Experts can manage without, and may sometimes smile at those who are obliged to use it, but the increased facility which it gives is such that no beginner should neglect it. The objection that it causes the patient inconvenience is a very trivial one. What the patient wants before all things is, that a correct opinion should be formed, and to this end he is quite prepared to make a little sacrifice of convenience. For want of the use of atropine I think I have known even experts overlook things which would have been apparent at a glance had it been used.

2. Always proceed on system. Examine the eye first without the object-lens, and ascertain the state of the cornea, lens, and vitreous. No mistake is easier to make, or more frequently made, than by the immediate employment of the inverted image to overlook the fact that the media are not perfectly transparent. With strong illumination you can look right through a slight opacity in the cornea lens or vitreous, and observe only that the retina and choroid are seen indistinctly. Many a diagnosis of "hazy retina" ought to have been "opaque vitreous." It is like criticising the beauty of a prospect, and declaring that it looks dull, when you have forgotten to observe that the window wanted cleaning. If you have any doubt as to the state of the cornea

or lens, examine them by oblique illumination before going further. Many opacities in the cornea are so slight that you overlook them on naked-eye inspection, and also with the ophthalmoscope mirror, but find them directly by oblique illumination. Need I add that you must be very particular that your object-lens, when you use it, is quite clean. Any stains on it will be seen as if on the patient's retina.

3. Having completed your examination of the media, still proceed on system. The next duty is to estimate the length of the eyeball. A patient may come complaining that he is rapidly loosing his sight, and you may find that it really has become so defective that he cannot read the largest ordinary print. You hastily assume that he must have some disease of the deep parts, some form of amaurosis. You proceed to ophthalmoscopic examination, and again hastily employ both mirror and object-lens, and it is quite possible that you may overlook altogether the fact that the eyeball is much too short and the patient hypermetropic. In high degrees of hypermetropia, if sudden failure of accommodation happen to occur, the defect in sight may often be so great as to draw the attention quite away from the right scent. I have already described the method by which we ascertain whether an eye is abnormal as to length. For the benefit of the mere novice, I may, however, here add, that whenever without the object-lens, any of the details of the fundus—vessels, disc, patches, &c.,—are easily seen, he may be quite sure that the globe is either too long or too short, or that the lens is wanting. If these objects are seen very easily, and the image very bright and beautiful, then, in all probability, it is an inverted image, and the eye is myopic. If only large trunks of vessels have been seen, and these not easily kept in view, then probably it is the erect image, and the eye hypermetropic.

4. Still proceed on system. Having ascertained that the media are clear, and that the eyeball does not materially deviate from its normal length in either direction, you may now examine in succession the optic disc and its vessels, the retina, and choroid near to it, the yellow spot, and lastly, the outlying districts. I must mention each of these separately.

5. The Optic Disc. Note its shape, its margins, whether definite or otherwise, its colour, and its level. Observe whether the vessels upon it are seen sharply or not, and look particularly as to how they conduct themselves, at its margin. Distinguish between artery and vein, and note the size of each. It is a common mistake with young observers to pay attention to the vein only. In the healthy state the disc should be round, and its choroidal rim distinct and sharp; the vessels on its surface should be seen with beautiful clearness, and the difference between vein and artery, as to size and colour, should be readily distinguished. In the centre, or near it, and close to where the trunks of the vessels dip back, there will be seen a bright white patch. This white patch may be large and very conspicuous in some eyes, and small in others, whilst still the eye is not in the least diseased. As regards the vessels, you must distinguish between the large branches of those destined to supply the retina, and the minute ones which give a general pink tint to the nerve itself. The latter may be much diminished, whilst the former retain their size.

Amongst the more common peculiarities displayed by the disc in a state of disease, we have—

1st. The formation of crescents by its side, or of irregular circles around it in myopia.

2nd. A jagged condition of the choroidal rim, indicating either the commencement of crescents, or the previous occurrence of inflammation (neuritis).

3rd. A hazy semi-opaque appearance of the structures in which the retinal vessels run, by which the latter are in part concealed and rendered indistinct. In this state the margins of the choroidal rim are concealed, and the disc appears to be much increased in size, and to be limited by a shaded, indistinct edge. This "woolly" condition implies neuritis.

4th. The disc may be too red or too pale. The pallor sometimes amounts to absolute whiteness, sometimes it is blue-white, and sometimes it is a dirty grey tint. Sometimes the pallor affects the whole disc surface, and at others

only a part. If only a part, the third next to the yellow spot is that usually affected, and in commencing cases this is always the first to suffer. The pallor may indicate mere anæmia, with, perhaps, primary atrophy, or it may indicate an anæmia and atrophy which are secondary to inflammation. It requires much experience to decide this point.

5th. The disc, instead of being on the same level as the rest of the retina, may be pushed backwards, or cupped as it is called. This cupping will be recognised by carefully tracing the main trunks of vessels and observing whether they curve on passing over the choroidal margin. If the cup is well marked, the vessels will bend so much that they are lost sight of at the edge of the disc, to be found again on its surface, looking much smaller and paler than those in the retina, and requiring a little movement of the object-lens to bring them well out. Cups of this kind imply intra-ocular pressure, the characteristic of the disease known as glaucoma. With them pulsation of the vessels may often be observed.

Having carefully studied the disc, your attention will next be directed to the retina and its vessels. The retina ought to be almost perfectly transparent, but in dark eyes—and particularly in members of the dark races—a delicate haze, or bloom-of-plum appearance, may be observed in it, especially near to the yellow spot. You ought to be able to trace the retinal vessels with the greatest ease. If this cannot be done, then inflammation of some kind or degree is present. The grand characteristic of inflammation, as far as the retina is concerned, is opacity. This opacity may vary from the merest haze to that of the dense white or grey pellicle. By this haze the trunks of the vessels will probably be more or less concealed, but if the deeper layers of the retina are affected, their concealment may not be much. You will remember that the retina consists of three principal layers—that of rods and bulbs, which is close to the choroid, and probably fed by it, that of nerve cells, granular matter, &c., in the middle, and that of nerve-tubes (derived from the optic), &c., which is innermost. It is in the latter layer only that the arteria and vena centralis run: these vessels have nothing to do with the deeper or outer layers. The inflammation may affect chiefly either the inner or outer layer, being in the one case, a neuro-retinitis, in the other a choroido-retinitis.

In some cases of retinitis, as in that which attends Bright's disease, hemorrhages are very common.

The yellow spot is recognised almost as much by its negative features as by any distinctive peculiarities. It is situate a little to apparent nasal side (inverted image) of the optic disc, and is exactly opposite the observer when the patient looks at the ophthalmoscope mirror. No large vessels cross it. It is more highly pigmented than the neighbouring parts, and also often looks rather hazy and indistinct. It is here that the deposits characteristic of Bright's disease are earliest seen.

The choroid is the tissue which gives colour and glow to the fundus. It may vary exceedingly within the limits of health, and its variations will cause apparent haze, or otherwise, in the retina. Before trusting yourself to any ophthalmoscopic descriptions whatever, examine carefully the differences in the eyes of fair and of dark persons. In the latter you will find the choroidal epithelium full of pigment, and showing dark mapped-out areas, which might easily be supposed to be morbid, whilst the vessels of the choroid are concealed. In the fair-complexioned eye the leashes of vessels will be seen with marvellous brilliancy, and beauty, and the suspicion of atrophy will be suggested.

It is much more common to see the results of inflammation in the choroid than to trace the early stages of such. The results are permanent, and very conspicious. The epithelium may be absorbed in large patches, usually with masses of black pigment remaining. The absorption may implicate deeper layers, and be attended by atrophy of the vascular rete and exposure of the sclerotic. The patchy condition in a case of choroiditis disseminata may be compared to that of a piece of well-marked tortoise-shell.

Inflammation of the choroid in patches is usually of syphilitic origin. Atrophy of the choroid, independent of inflammation, is frequent in advanced states of myopia.

Inspection of the outlying districts of the fundus is easily done, by making the patient look upwards, downwards, &c., strongly. It should never be omitted; for not unfrequently changes may here be discovered which will be the key to the case. It is here that the dots of pigment, characteristic of retinitis pigmentosa, will be first found. Here also, in syphilitic inflammation of limited degree, patches may be sometimes found when there are none in the central parts of the fundus.

Having mentioned some of the chief morbid conditions to be expected, I will now specify some of the errors into which novices with the instrument are likely to fall. Like all other instrumental aids—and the stethoscope is a prominent example—the ophthalmoscope must be expected to lead to many mistakes. It is difficult to use, and requires long experience before the observer can trust his own interpretation of what he has seen. Want of familiarity with the varying conditions which may be met in health, is a main cause of error. Thus a well-pigmented choroid in a dark complexioned person may be easily misapprehended. A very large physiological cup may be taken for "white atrophy," or for a glaucoma cup; a margin of black pigment at the edge of the disc may be attributed to disease; and alterations in size of vessels, which are peculiar to the individual, may be supposed to imply anæmia or congestion. It is possible, also, in a highly pigmented eye, to mistake the yellow spot itself for the remains of a blood clot. As to the common error of fancying the retina hazy when the appearances are due to opacity in one or other of the media, I have, I think, already said enough.

Degrees of vascularity are especially difficult of satisfactory comparison. You will hear one authority assert that the disc or retina is congested, when another will declare that they are quite normal. Let me warn you against the diagnosis of "congested retina." In four out of five of the cases in which the words "hyperæmic retina" are used, they are probably employed in error. Both in the optic disc and in the retina, the size of the vessels may differ widely and be still within the bounds of health. Just as one person may have a florid cheek and red ears, and another pale ones, yet both be in good health, so may the colour of the optic disc and the size of the retinal vessels differ. The conditions of the circulation in the retina are such as to make any condition analogous to erythema of the skin simply impossible. If you find the retina visibly reddened, be sure that it is not simply "congested," but stained by effusion, in fact, inflamed. The individual arteries are too far apart to give any general red colour to the whole. The interpretation of congestion must rest on the enlargement of their trunks only; and this, which is a comparative question, is very difficult to estimate. The old notions as to active congestions preceding inflammation, must be abandoned for the retina, as elsewhere. We now know that cell changes are the essential factors in inflammation, and that it is these that induce vascular changes. I do not by any means deny that the optic disc and retina may in some cases contain too much blood, and yet show no trace of inflammation; but I feel sure that these conditions are far less frequent than they are thought, and I warn the beginner against the fatal facility of explaining amblyopia by discovering congestion.—*Clinical Reports of London Hospital*, 1867–8, *p.* 182.

75.—ON SCLERONIXIS: A CLINICAL LECTURE DELIVERED AT THE UNIVERSTIY OF PAVIA.

By Professor A. Quaglino, Lombardy.

[These remarks of Professor Quaglino are chiefly valuable as applicable to all such damp situations as he describes at the end of his paper. The thirst after novelty at any price has led us to forget those older operations which form the best inheritance our ancestors have bequeathed to us. It must be remembered that the basis of all the new operations for cataract are extraction and depression, or scleronixis.]

Simple lateral depression with the needle for hard cataracts; simple division,

or associated with linear extraction, for cataracts of cheesy or milky consistence, are the operations I prefer.

[The author then gives a table of twenty-eight cases of depression of cataract, twenty-six of which were successful, one only unsuccessful, and one required a secondary operation. Are not these results worthy of comparison with those of extraction?]

I must give my reasons for resorting more frequently to this method than to any other.

I had, for some time past, observed that extractions were too frequently followed by suppuration of the flap. This sometimes commenced by a disintegration of the cicatrix; and, moreover, generally just by the time I had come to regard the success of the operation as certain. Suppurative aquocapsulitis, prolapse of the iris, distorted pupil, or even a closed one, synechiæ, secondary cataract, and often, atrophy of the eye, were among the sad results of this extraordinary form of suppuration. What astonished me the more was, that I had very rarely observed such an occurrence in my practice at Milan, either in private or at the Fate bene Sorelle Hospital. This recalled to my mind the precepts of my predecessors Scarpa, Flarer, and Panizza, who at this very same clinic operated for cataract almost exclusively by scleronixis, and only exceptionally by extraction.

Being as warm a partisan for extraction as any of the modern ophthalmic surgeons, I with but bad grace resorted to depression—a method which the physiology of the eye seemed to have undoubtedly stamped as inferior to that of extraction.

Nevertheless, after what you have seen of scleronixis, should we be right to disregard this method, and to condemn it to the exile and oblivion a distinguished writer of the present day would insist on?

I am surprised to see brought forward, and there and then extolled to the skies, new operations, which possess far greater disadvantages than the old ones, and which are much more dangerous; thus banishing almost entirely a method much less exposed to such disadvantages, and which can boast of its solid successes.

We are, I believe, too much in the habit of allowing ourselves to be led away by the spirit of innovation, and of too readily accepting the dicta of authorities in place of following in the experimental path which our predecessors have traced out for us.

No doubt, to obtain favourable results from depression, we must attend to certain points, both in the operation itself and in its after-treatment. Before proceeding further, I shall quote a few *à propos* words of Scarpa:—

"Impartial observation and experience," he says, "the great arbitrators of all such matters, appear to have declared themselves in favour of this old operation (depression); for it is easier to do than extraction; it is applicable to all kinds of cataracts, whether hard or soft; the consecutive accidents are less serious and less dangerous than those which follow extraction; and lastly, should the operation, in consequence of some accident, fail, it can be repeated twice or thrice, without danger, on the same eye."

Professor Flarer, my own master, held the same opinion; and, I must say, acted on it successfully.

The most permanent and brilliant results of depression are, we must acknowledge, obtained in the case of cataracts which are either soft or cheesy in consistence, in the fluid ones which occur in middle-aged people, and in those which occur in infancy. In hard, senile cataracts it may be adopted, but more exceptionally.

In every case, the precept of Scarpa must be borne in mind—that is to say, to open out widely the anterior capsule, without which a secondary capsular or membranous cataract may form. To effect this essential step, I depart somewhat from Scarpa's practice. Instead of making the incision of the capsule transversely, with a straight lance-headed needle (I do not employ Scarpa's curved one, which is much less easy to manage), at the same time as the lens is depressed, I prefer making at once two vertical incisions, which cross the capsule at each extremity of its transverse meridian, and then pushing the

middle of the capsule together with the lens proper, down into the vitreous by the flat side of the instrument. It is much more easy to lacerate the capsule at this stage of the operation, than it is after the lens proper has been depressed; for then it is almost impossible to make any further incision of the capsule, which yields to the least pressure of the instrument, be it ever so exactly directed. I make the first of my incisions before I have hardly well entered the anterior chamber; the second one on the nasal side I make by bringing the point of the needle towards the nose, penetrating the capsule *de novo* at its transverse meridian. Moving the needle from below upwards, tilting its handle, suffices to open out the vertical parallel incisions. This done, I proceed to the second step. This consists in depressing and sinking the lens, which I plunge into the vitreous humour, below and to the outer side, into a space bounded by the inferior and external recti muscles. In sinking the lens, a third incision is made in the capsule, the lower part of which is depressed, and so wide a breach of continuity is made in the anterior capsule as to render any kind of union of the portions of the capsule impossible, the danger of any secondary cataract being thus removed. By adopting the manœuvre I have just described, I have hardly ever had any secondary cataract.

If the cataract is soft, or of a cheesy consistence, it may be broken up with the needle, the nucleus or any large particles sunk in the vitreous, and the rest of the cortex left to become absorbed, or, to hasten the cure, even brought forward into the anterior chamber, and then extracted by a curette through a simple linear incision in the base, and external periphery of the cornea.

If the cataract is hard, of an amber colour, after the capsule has been lacerated in the manner indicated, the lens must be sunken to the side into the vitreous by a pretty quick, but delicate movement of the needle; so that it becomes buried in this humour, without, however, coming into contact with the bottom of the chamber, *i. e.*, the inner coats, on which it would act like a foreign body.

This manœuvre is easy when the hyaloid has undergone atrophy, and the vitreous humour is more fluid than natural, but becomes more difficult when the vitreous is of normal consistence, and thus offers greater resistance to pressure and favours the rising up of the cataract to its old place. In the case of membranous or secondary cataracts division may still be practised with a straight needle, and it is well accomplished by the manipulation we have spoken of for lacerating the capsule.

The depression of the entire mass of the crystalline lens is hardly ever obtained. To effect this the zonule of Zinn must be cut through at its upper part, and the crystalline in its capsule must be dislocated downwards before depressing it; but this depression of the entire cataract, without lacerating its capsule, is not the practice we propose, nor is it desirable, inasmuch as its absorption is thus prevented. It thus always occupies the part of a foreign body in the interior of the eye, and ends by leading to atrophy of the globe after a series of more or less neuralgic and inflammatory symptoms on the part of the coats of the eye and of the ciliary nerves. In every case we must try to open up the capsule, so as to expose the substance of the lens to inhibition, to maceration in the aqueous humour, and to absorption.

If we compare the results with those of extraction and its various modifications, that is to say, with suppuration of the corneal flap, suppurative aquocapsulitis, iritis, prolapse of the iris and its consequences, finally panophthalmitis, we shall see that the results (successes) of scleronixis are perhaps not much below those of extraction; and, for our part we must acknowledge that they are superior, seeing that absolute loss of the eye hardly ever happens. But to what is this due? I think myself warranted in asserting that it depends entirely upon circumstances local and endemic entirely confined to this city, to this province, as it is to the whole of lower Lombardy, where the irrigation of the soil has been carried to its maximum for the cultivation of rice, and has thus converted the district into one vast swamp, productive

of myriads of organised beings, infecting its atmosphere with miasmata and humidity.

To this we must add the bad constitutions of our peasants, enfeebled by miasmata, by the pellagra, by insufficient and bad food, and damp dwellings. To these same causes must, I think, be attributed the erysipelas and hospital gangrene, which so frequently follow operations and wounds of the most ordinary and trifling description; and it is for this same reason perhaps that operations for hernia are more dangerous than in other more elevated provinces, and also autoplastic operations so commonly go wrong, and to these same causes which we see in this province of Italy may be attributed the more frequent recurrence of cataract than in other parts, a fact which has afforded me the opportunity of studying the subject on a large scale.

We are now studying an entirely new modification of the operation for cataract, that of Professor von Græfe. The wound of the sclerotic is covered by the conjunctiva, and thus appears to offer a better chance of union. Whether this actually be so or not, is a matter we are at present submitting to experience.—*Ophthalmic Review*, *Oct.* 1867, *p.* 371.

76.—FURTHER EXPERIENCE ON REMOVAL OF THE LACRYMAL GLAND AS A RADICAL CURE FOR LACRYMAL DISEASE.

By J. Z. Laurence, Esq., Ophthalmic Surgeon to St. Bartholomew's Hospital, Chatham, and to the Ophthalmic Hospital, Southwark.

[Before reading the following article, our readers would do well to refer to Mr. Laurence's previous one on the same subject in *Retrospect*, vol. liv., p. ——. Mr. Laurence states that so far as his knowledge extends, the lacrymal gland has been removed twenty times for the cure of lacrymal disease, and with hardly an exception a permanent cure of the principal symptom—epiphora—has resulted. Moreover, what is very remarkable, this result ensued whether the gland was wholly or only partially removed. A possible explanation of this is, that the excretory ducts being severed, the gland left behind atrophies.]

The first question put to me by all those who have heard of my operations has been: Does the eye continue moist after the operation? It does, completely so. My experience in this point of view is corroborated by that of Mackenzie and of others, who have removed the lacrymal gland on account of tumours of its substance. Thus, Mackenzie states, "the moisture and lubricity of the conjunctiva remain unaffected after extirpation of the lacrymal gland." In Dr. O'Beirne's case, in which the lacrymal gland was removed on account of its enlargement and induration, the patient suffered no inconvenience. Nor did Mr. Dixon's patient, who underwent the operation on account of traumatic obliteration of the canaliculi. These facts appear to show that the moisture of the globe is normally furnished by the Meibomian glands.

What effect has the removal of the lacrymal gland on the *abscess of the lacrymal sac?*

The study of my own cases has shown me that after a varying time the secretion of pus from the mucous membrane of the sac decreases, and finally disappears.

Where this result does not progress favourably and spontaneously, it may be promoted by slitting up the lower canaliculus, in order the more efficiently to apply local remedies to the mucous membrane, either in the form of collyria or injections by Anel's syringe. Vin. opii, or weak solutions of argent. nitrat. (gr. i—iv. ad. ℥j.), I find to answer best, applied once or twice a day, washing out the sac with injected water a few times during the day in the interval of the collyria.

My conception of the mode of origin of the abscess of the lacrymal sac is that the sac, in the first instance, gets distended with tears, which are more or less completely pent up within its walls, according to the more or less complete imperviability of the nasal duct. The mucous membrane thus gets irri-

tated and congested, from its undue tension, and possibly from the circulation in its vessels becoming impeded. The tears themselves probably acquire acrid properties during their undue retention in the sac, from chemical changes which may be aggravated and accelerated by the subsequent admixture of the purulent secretion. This purulent secretion, after a time, reacts as a secondary cause of abscess, both by its adding to the distension of the sac and by its own intrinsic irritating properties—probably augmented, as in the case of the tears, by changes in composition from undue retention. Cystitis from an over-distended bladder, due to some obstruction to the flow of urine—whether this be stricture of the urethra, enlargement of the prostate, or any other cause—appears to me to afford an excellent illustration of the mode of formation of lacrymal abscess. Not that I deny that exceptionally dacryocystitis may arise idiopathically in the same way that cystitis may—for I have seen a few such cases myself. That over-distension of the lacrymal sac is the usual cause of its abscess, is indirectly proved by the observation which may be made daily, that watering of the eye from eversion or obstruction of the puncta lacrymalia never causes abscess of the sac. In one case, the watering of the eye ensued from a fibro-plastic tumour compressing the sac, and ceased after I removed the tumour.

After what I have said, I think we should neither feel surprised, nor disappointed, that removal of the lacrymal gland does not cure the lacrymal abscess—which may, and often has, existed, off and on, for years—so soon as we could wish; that a purulent fluid exudes from the puncta, on firm pressure over the sac, not unfrequently for months after the operation. The removal of the lacrymal gland removes the primary cause of the abscess, but it neither removes the inflammation of the mucous membrane nor its disposition to secrete pus, which, as I have endeavoured to show, acts as a secondary cause for the continuance of the abscess; this, having become established as an independent condition, may take more or less time to disappear—moreover that this is greatly promoted by the removal of the continuous irritation of the mucous membrane by the pent-up tears, is a fact, I can, from repeated observation, most positively affirm. In three cases [Cases 9, 11, and 19] in which the lacrymal gland was removed, acute abscess of the sac followed the operation, but soon subsided, and, indeed, seemed to expedite the cure of the preceding chronic abscess. In my own two cases the perviability of the nasal duct was remarkably restored after the operation. I do not know how to explain this fact, but it would induce me in other cases to obliterate the sac after removal of the gland, should the abscess not yield to milder measures, such as those which I have previously indicated.

I shall now describe the method of operation which I adopt.

The instruments required are—a long narrow scalpel; blunt-pointed scissors; a small, sharp, double hook, such as used to be employed to evert the globe in the old operation for squint; a pair of bulldog-catch long forceps; needles and silver wire.

Chloroform is administered to tolerably perfect anæsthesia. The skin immediately below the upper and outer third of the orbital ridge is divided with the scalpel. In this step of the operation the skin may be made tense by drawing it from side to side with the fingers; but it being very movable at this spot, care must be taken not to draw it up or down, otherwise the incision will fall over the frontal bone, or too far beneath the edge of the orbit, and as the lacrymal gland is in close contact with the roof of the orbit, there may be some difficulty in finding it. After the skin has been divided, the fascia connecting the periosteum of the orbit with the upper edge of the tarsal cartilage is cut through, and the orbital cavity is gradually entered by successive cautious strokes with the scalpel. After a sufficient cavity has been made into the orbit, the gland is felt for on the roof of the orbit by the fore or little finger of the left hand. After a little experience it may be recognised by the touch as a hardish, smooth, round body. In feeling for the gland, care must be taken not to push the finger too forcibly back into the orbit, otherwise the gland may, from its very loose attachment to the periosteum of the orbit, be dislocated from its normal situation, and pushed

back into the orbital cellular tissue, or left attached to the fascia covering the eyeball, and its discovery and excision be rendered difficult, or as I, in one or two cases, found impossible without making an unwarrantably large opening into the orbit. Should there be any difficulty in feeling the gland, it is better to, at once, divide the external commissure of the lids by an horizontal incision outward, made to meet the outer end of the first incision. A triangular flap will be thus formed with its apex outwards; this flap is then thrown inwards, and the outer and upper angle of the orbit is thus freely exposed, when the gland will be much more readily reached, and may, in such cases, be found more in contact with the outer surface of the eyeball than with the roof of the orbit. Before making either of the above two incisions, I always feel for the pulsation of the temporal artery, so as not to wound it; and this has never occurred in any of my operations. After I have assured myself of the exact position of the gland, I pass the double hook along the side of the finger of my left hand, as a guide, keeping its points along my finger; I then half-rotate the handle of the hook, so as to bring the points of the hook towards the gland, which I firmly transfix with these points, draw it forwards, and carefully sever it from its connections with the end of the scalpel. After removing what I consider to be the gland, I invariably make a section of it, in order to assure myself that what I have removed is really the gland and not portions of the orbital cellular or fatty tissue. The section of the lacrymal gland is firm, dense, of a tawny colour, and of the usual lobular structure of racemose glands, and with the slightest care cannot be confounded with any other of the orbital tissues. As I have before said, although it is desirable to remove the entire gland, it is by no means a *sine qua non* for the success of the operation; so that it is wrong unnecessarily to extend the limits of the operation, no good end being thus attainable, but on the contrary, certain untoward consequences may ensue, to which I shall, shortly, more particularly allude. After the gland has been thus removed, pretty sharp hemorrhage generally ensues, an artery of the orbit (probably the lacrymal branch of the ophthalmic) being the main source of the bleeding; but this has, in all my cases, without exception, always stopped on the application of a stream of cold water from a sponge. The wound should not be closed till the bleeding has stopped, otherwise shortly after the operation the upper lid may become enormously distended by blood extravasated into its loose cellular tissue—a result which I have in a few of my cases witnessed, when I had closed the wound without sufficiently attending to the above precaution. The wound may be closed by silver wire sutures, and care must be taken to place the parts in accurate apposition, more especially if the external commissure of the lids has been divided in the operation. In this case, the suture which requires the most accurate adjustment, is that which fastens the outer apex of the triangular flap to the skin of the temple. The wound may then be treated on general surgical principles: cold water-dressings, followed by warm ones, and even poultices, should any inflammatory action set up. In by far the greater number of my cases union has taken place by the first intention, and after a few weeks little or no trace presents itself of an operation which at the time of its performance appeared one of considerable severity.

It is now incumbent on me to state certain unwished for results which may follow the operation. In most cases slight conjunctivitis ensues; this, in one case, ran on to inflammation of some of the deeper structures, which however gradually subsided under appropriate treatment, without, however, inflicting any permanent injury to the eye.

But by far the most serious result which may follow the operation is ptosis of the upper eyelid. This was, in almost every case in which I observed it, of purely inflammatory origin and gradually subsided spontaneously, but in a few instances it was apparently due to a partial division of the levator palpebræ. In Case 10, I am afraid that, owing to a free use of the knife, I must have divided or bruised some of the muscular nerves; for the ptosis was at first complete, although it subsequently became less, and the lateral movements of the eyeball were so paralysed as to give rise to considerable binocu-

lar diplopia. Ever after this case I have been particularly careful not to prolong the orbital incision of the operation either too far inwards or too deeply backwards. Indeed, in two instances in which the difficulty of removing the gland without a dangerous extension of the limits of the operation appeared to me impossible, I considered it a more surgical procedure to close the wound without removing the gland at all. It surely exhibits a very puerile feeling, besides a want of moral courage, to sacrifice the welfare of a patient to one's own false pride. Many years ago I saw a remarkable instance of this in another branch of surgery—a hospital surgeon would not be "foiled" in his attempt to introduce a catheter—within four-and-twenty hours the patient had a shiver, and shortly afterwards died from purulent infection.

I have not, as yet, met with any other untoward effects from the operation than those which I have mentioned.—*Ophthalmic Review*, *Oct.* 1867, *p.* 361.

77.—EPILATION AS A CURE FOR OPHTHALMIA TARSI.

By Jonathan Hutchinson, Esq., Surgeon to the London Hospital.

Ophthalmia tarsi, or tinea tarsi, consists essentially of a chronic inflammation of the hair-sheaths of the eyelashes, and of their proper glands. In bad cases the inflammation involves adjacent structures, the skin, mucous membrane, &c. The discharge adheres to the roots of the lashes, and forms a crust which prevents remedies from gaining access to the inflamed part. By far the quickest mode of cure is by the careful and complete removal of the hairs. The hairs usually come out with their sheaths adhering, showing that the lining membrane has been loosened by inflammation. In bad cases, two or three removals, at intervals of two weeks between each, are necessary. The hairs grow again very quickly, and in about six weeks attain their normal length.—*Clinical Lectures and Reports of the London Hospital*, 1867–8, *p.* 220.

78.—ON SOME OF THE ANOMALOUS EFFECTS OF ATROPINE ON THE EYE.

By George Lawson, Esq., Assistant-Surgeon to the Royal Ophthalmic Hospital, Moorfields.

Atropine is chiefly used in ophthalmic practice to procure dilatation of the pupil, and to act as a sedative in various forms of inflammation of the eye. The preparation which is generally prescribed is the sulphate of atropia, this salt being preferred to the alkaloid, on account of its greater solubility, for whereas the sulphate is readily dissolved in distilled water, atropia is soluble in water in the proportion only of 1 in 500 parts.

In an ordinary healthy eye, where the retina possesses its normal sensibility, and the iris acts freely, I have never known atropine fail to dilate the pupil; but as a sedative to the eye, I have, on a few occasions, seen it not only fail, but act as a direct irritant, and in two cases which I have to relate it caused the most acute and troublesome symptoms.

In speaking of the anomalous symptoms produced by atropine, I would state my belief that they are entirely exceptional, and that whilst it is well to be aware that they may possibly arise, yet I do not think they ought to prejudice the surgeon against the use of a drug which, when fitly prescribed, is, in the large majority of cases, most beneficial. That a solution of the sulphate of atropia will occasionally produce irritation has been noticed by several ophthalmic surgeons, and the reason of its acting in this irregular manner has been attributed to the presence of some free acid in the solution. The salt has not been neutral, and the solution has given a slightly acid reaction to litmus paper, and to this has been attributed its irritating effects.

I think myself that the explanation is wrong, and that the free acid theory has but little, if anything, to do with the fact that a solution of atropine will occasionally give rise to very painful and troublesome symptoms. What

amount of free acid can there be in the one or two drops which are dropped into the eye from a solution of the sulphate of the strength of gr. j. ad aquæ ʒ j.? and yet when thus diluted I have seen it occasion great irritation. We use daily in ophthalmic practice salts which contain much more free acid than the sulphate of atropia, such as the sulphates of zinc and alumina, but I do not remember any instance in which they have caused the peculiar forms of irritation which, in exceptional cases, I have seen spring from atropine. I believe that when atropine acts thus as an irritant, or produces peculiar and distressing symptoms, it is due to some idiosyncrasy on the part of the patient, which renders him intolerant of the alkaloid or of its salts, and, in some cases, of any preparation whatever of belladonna. In one or two patients in whom even a very weak solution of atropine has given pain to the eye, I have found that a solution of the extract of belladonna has been borne without even a feeling of annoyance, whilst in other cases the use of belladonna in any form whatever has seemed to act almost as an irritant poison.

The anomalous symptoms which atropine may produce are—

1st. A sense of smarting and heat in the eye, accompanied by redness and lachrymation. These symptoms may pass off in a few minutes, or they may extend over some hours, or even continue for many days.

2nd. An erysipelatous condition of the eyelids and surrounding integuments, with redness and chemosis of the conjunctiva.

As an illustration of the first class of symptoms I will cite the following case:—For a patient on whom I had ten days previously operated for cataract, I ordered a solution of atropiæ sulph. gr. j. ad aquæ ʒ j., to be dropped into the eye twice daily. The drops caused so much pain and redness of the eye that she was obliged to discontinue their use. On another occasion the same patient called at my house to have the eye which had not been operated on examined with the ophthalmoscope. Thinking that the irritation which had previously followed the use of the atropine might have been only an accidental occurrence, and due really to other causes, I dropped again into the eye some of the atropine drops. A little smarting was the immediate result, but the pupil became dilated, and I was able to examine the eye. By the time, however, she had reached home, the pain had much increased, and the eye shortly became acutely inflamed, and continued so for some days. This patient, I afterwards found, was able to use a solution of gr. v. of the extract of belladonna to the ounce of water without the slightest annoyance.

I have frequently seen atropine produce a momentary sense of pain at the time of its being dropped into the eye, accompanied with a flushing up of the conjunctival vessels, but, as a rule, these symptoms have lasted but a short time.

The next case is an example of the second group of symptoms which may be caused by atropine. At the beginning of this year I operated on a gentleman for cataract. The case at first progressed very well; but as there was a little soft lenticular matter in the pupil, I ordered a solution of sulphate of atropia (gr. j. ad aquæ ʒ j.) to be dropped into the eye twice a day. Soon after its application the eye became very painful, with the lids swollen, and on the following day there was a distinct erysipelatous blush over the lids, and extending down the face. As I had never seen erysipelas follow the extraction of an opaque lens, or the use of atropine to the eye, I regarded its occurrence as an accidental circumstance; but as the drops gave pain, they were stopped, and a lotion of the extract of belladonna was substituted. The erysipelas, however, increased, spreading over the head and forehead, and down the face. The belladonna lotion was shortly afterwards discontinued, as with the swelling of the lids it was not only useless, but it seemed to give pain. All the severe symptoms now abated, and the patient soon recovered, but with the pupil closed by opaque capsule. About six months afterwards the gentleman called upon me at my house, as I wished to examine the eye previous to performing a needle operation. In order to ascertain how much the pupil would dilate, I dropped into the eye two drops of a solution of atropiæ sulph., gr. ii. ad aquæ ʒ j. I had not at that time connected the erysipelas with the use of the belladonna, and was quite unpre-

pared for the symptoms which were to follow. Very shortly after I had put the atropine into his eye, he complained of pain, which steadily increased; and about four hours afterwards the lids began to swell, and a distinct erysipelatous blush showed itself. By the following morning he was unable to open the lids on account of their swollen state, and there was a diffuse form of erysipelas extending from the lids to over the brow and face. As there was now no further application of any form of belladonna, the symptoms having reached a certain height, gradually subsided, and the patient in about a week recovered. In this patient the relationship between the cause and effect was so manifest that there could be no doubt that the erysipelas was solely due to the atropine. Not only was he unable to bear the use of atropia, but a solution of the extract of belladonna evidently kept up the irritation in his first attack of erysipelas.—*Ophthalmic Hospital Reports, April*, 1868, *p.* 119.

79.—CHLORIDE OF ZINC DROPS FOR THE EYE.

By Jonathan Hutchinson, Esq., Surgeon to the London Hospital.

Chloride of zinc appears to me to possess some advantages over other astringents as a remedy for certain forms of ophthalmia. I have used it in solutions of from two to four grains to the ounce, usually the weaker one. It is suited for the same class of cases that we use nitrate of silver or alum for, *i. e.*, the catharrhal or purulent. In one case of very threatening diphtheritic conjunctivitis, in an infant of eight months, it succeeded admirably. It is less painful than nitrate of silver, and the two-grain solution may be used freely for the youngest infants. In the late stages of gonorrhœal and of purulent ophthalmia, after nitrate of silver has produced a partial cure, it is very useful. In typical cases of catarrhal it is not, I think, equal to nitrate of silver. In certain cases of pustular ophthalmia, I have found it suit well where other astringents had done no good.

A good rule in the use of stimulating or astringent eye-drops, is to change the formula occasionally. Often when nitrate of silver will do no more, chloride of zinc will finish the cure, and *vice versa*.—*Clinical Lectures and Reports of the London Hospital*, 1867–8, *p.* 219.

80.—USE OF SETONS IN THE TREATMENT OF EYE DISEASES.

By Jonathan Hutchinson, Esq., Surgeon to the London Hospital.

I have of late years formed a still higher opinion of the efficacy of setons in the treatment of certain chronic inflammations of the cornea. They were much used formerly by Mr. Scott, and for the last twenty years have had a warm eulogist in Mr. Critchett, from whom indeed I first learnt the rules for their employment.

Chronic ulcerations of the cornea, attended by much intolerance of light, are the cases which require them. I think the degree of intolerance and irritability measures the necessity for their use. In the early stages of corneal ulcers, they are less decidedly useful than in the later ones; but my impression is, that in these they often prevent a case from advancing to a worse stage. They never do harm, and they cause very little pain. I have used them frequently for infants, and for cachectic, "strumous" children. The result usually is that within a week the local irritability ceases, the feverishness abates, the appetite returns, and the strength begins to improve. The seton should consist of two threads of thick silk, and should be put into the temple amongst the hair, so as to leave no exposed scar.

They are more decidedly useful where only one eye is involved than when both suffer. They do no good in syphilitic keratitis, nor in cases which are accompanied by granular lids.—*Clinical Lectures and Reports of the London Hospital*, 1867–8, *p.* 219.

81.—SULPHATE OF SODA AS A MEANS OF REMOVING OPACITIES OF THE CORNEA.

By Dr. Henry Power.

[The prospects of the cure of a corneal opacity must depend upon whether the lamellæ of the cornea have to any considerable extent broken down, and their places become occupied by connective tissue. The forms most likely to be benefitted by local stimulant or irritating treatment, are those which are included under the terms nebula and albugo.]

The following cases will afford examples of the effects of treatment of corneal opacities with sulphate of soda:—

Cordelia G., aged 47, applied at St. George's Hospital, in Dec. 1867, for opacity of the cornea, the result of accident ten years previously, which was followed by severe inflammation. The cornea was uniformly so dull, that the position of the pupil could only just be discovered, and she was unable to see any type. No inflammation was present. The use of sulphate of soda was commenced, and continued for two months. At the expiration of this time the cornea had so far cleared that she was able to make out the heading of a newspaper, and by the end of July could discern No. 4½ of Snellen's test types, which is the size of large ordinary print.

Case 2.—E. L., aged —, the son of an Italian carver, suffered in April and May from severe keratitis: as a result a large nebula on the lower part of the cornea was left. In the middle of July, he began the use of the sulphate of soda, which was steadily continued. At the end of August the cornea was almost perfectly clear, only a scarcely appreciable speck remaining, which there is little doubt will ultimately vanish.

Case 3.—The following will show the effect of the sulphate on an ordinary case of nebula left after superficial keratitis. W. T. applied at St. George's on the 23rd of January, 1868, with a nebulous opacity of both cornea, which, though not very intense, was yet sufficient to prevent him from being able to distinguish more than the largest test types, about one inch in height, at one foot. The conjunctiva was slightly inflamed, and there was much intolerance of light. This condition was relieved by the application of a few leeches, washing the eye with alum lotion, and rest in a darkened room. As soon as the inflammatory symptoms had subsided, on the 31st of January, the use of sulphate of soda was commenced; and on the 14th of February he could distinguish the letters of the fourth size with great facility, and one month later was able to see the 8½ types.

Even in very dense leucomata, steady perseverance in the use of the sulphate effects some improvement, as is indicated by the following case:—A. L., aged 25, has for two years had a leucoma. On the 17th of April she commenced the use of the sulphate, having then only quantitative perception of light. On the 17th of July she stated that she could readily discern different colours, and could even see large objects when in motion. She is still continuing the use of the remedy.

It would be wearisome to the reader to introduce many notes of cases which all resemble the foregoing, and have only one or two salient points. Suffice it to say that the general results have been favourable, and I have only in one or two instances been compelled to discontinue its use on account of inflammation being set up. Experience has shown that in the employment of this salt the quantity that should be introduced at one time into the eye should not exceed one or two grains, and the most convenient mode of application consists in everting the upper lid, and brushing the powder lightly over the surface with a camel-hair pencil. The application may be repeated every or every other morning, or twice a week, according to the degree of reaction that follows. The immediate effect is to produce a considerable degree of redness and sharp smarting pain, with lachrymation, lasting for a half an hour or more, and therefore more persistent, though less in degree, than that produced by the vapour of bisulphide of carbon, or the vinum opii. After the continued use of the remedy for some weeks, the opacity is observed to be-

come fainter, and the patient is himself able to feel the improvement by his capability of reading types, the letters of which he was previously quite incapable of deciphering. In some cases when the reaction produced by the introduction of the pure salt is too violent, it may be lowered by adding a little starch, or by the employment of a solution of gr. 5 to ʒiv. I am inclined to think that its action is essentially that of an irritant, and that it exerts little or no solvent action on any of the forms of opacity which may be cured by its application. If a small quantity of the exsiccated and pounded sulphate be placed on the tongue it feels rough, and under the microscope it appears in the form of angular fragments of no determinate crystalline form, but of very variable size. On the addition of a drop of water the particles coalesce and form a solid cake, which can be moved from place to place on the slide with the point of a needle, and as the water evaporates long striated prisms appear at the margin. It is easy to conceive that the introduction of such a crystalline powder on the inner surface of the lid produces intense irritation, accompanied by copious lachrymation, and a great temporary increase of vascularity in the conjunctiva. Moreover the salt is very insoluble. I found it difficult to dissolve twenty grains in a drachm and a half of distilled water; and lastly, on soaking for many hours fine sections of leucomatous cornea, which had been preserved in chromic acid, I found no increase in transparency, though the application of glycerine and gum to similar sections rendered them in the same space of time exceedingly clear. It seems to me to act to the full as energetically as solution of bichloride of mercury, and as the vapour of the bisulphide of carbon, whilst it is free from the inconvenience of the fœtid odour of the latter, and the danger attendant upon the use of lotions containing the former.—*Practitioner*, *Sept.* 1868, *p.* 153.

82.—ON TWO METHODS OF REMOVING FOREIGN BODIES FROM THE EXTERNAL AUDITORY MEATUS.

By A. Gardiner Brown, Esq., Trinity Square, Southwark.

Too great importance can hardly be attached to the proper and successful removal of various foreign bodies from the external auditory meatus, and, seeing the subject touched upon in the impression of this Journal for March 7, I wish to point out two methods of extraction which have been of frequent service to me in cases where the foreign body is either spherical or bean-shaped.

Where the substance to be removed is not too tightly impacted in the meatus, atmospheric pressure (suction) may often advantageously be had recourse to in the following way:—A few inches of French vulcanized rubber tubing, of a size to fit the meatus easily, but not loosely, is cut at one end with a pair of sharp scissors in such a manner as to make it fit the visible surface of the foreign body somewhat neatly when pushed gently against it in the meatus. The end of the tube, before introduction, is moistened, and the direction of any inclination of the seen surface of the foreign body accurately determined, so that the cut end shall be properly applied to it. Suction, for the purpose of extraction, is now to be made use of in one of the following ways:—An assistant is to attach an ordinary ear syringe (the piston being home) to the other or free end of the tube, and make gentle suction by drawing out the piston-rod. Or the mouth may be applied to the tube; suction thus produced is extremely convenient, but not advisable if the presence of the foreign substance have set up any suppurative action or other discharge. Or let the left hand of the operator rest comfortably on the side affected of the patient's head, which must be well supported; gently, but firmly, grasp the rubber tube (nicely applied as before) with the thumb and forefinger of the same hand close up to the meatus; starting from this point, run the corresponding digits of the right hand somewhat rapidly along the tube to near its end, pinching it firmly at the same time to exclude all air. The vacuum thus made will act on the substance to be removed immediately the pressure of the left fingers is discontinued.

The above method requires some practice and nice manipulation in order to insure success. If thought desirable, the vacuum may be produced by connecting a piece of the rubber tubing to a phial by means of a cork pierced with a short glass tube, then removing the air by spirit lamp, as in cupping, or by boiling water. To obviate the tendency which rubber tubing has to collapse under atmospheric pressure, the greater part of the length employed may be substituted by quilled glass tubing, this latter being only tipped with the former.

Where the foreign body is spherical, it may often be successfully removed by a rolling-out plan being attempted in the following way :—Select a curved suture needle with a broad but thin point, and rub this extremity on a steel surface (as the blade of a knife), so as to allow the finger, when passed along the concave surface, to feel a slight "burr" or turning-over of the point. The operator is now armed with a microscopic hook of great relative power, and one which will hardly ever refuse to pass between the wall of the meatus and the obstructing body. This instrument should always be passed at that point of the circumference of the foreign body which presses least on the meatus, this being generally, I believe, either above or below when the form is spherical. The rolling-out process requires the needle to be inserted some five or six times over the object, especially when deeply seated. Care must be taken that the "burr" is well brought over the point of the needle in preparing it, or the repeated introduction will push the substance in further or as far as the traction brings it out.—*Medical Times and Gazette, Aug.* 8, 1868, *p.* 146.

83.—PLAN FOR REMOVAL OF FOREIGN BODIES FROM THE EAR.

By Jonathan Hutchinson, Esq., Surgeon to the London Hospital.

The best way that I know of for removing foreign bodies from the ear, is by the use of a loop of wire. The wire should be flexible. The patient's head being placed on its side, the operator should gently press the loop into the ear, turn it a little, and then withdraw. I have used this method repeatedly during the last ten years, and have never had any difficulty. Several times I have succeeded directly with it, in cases in which other means had been tried without success. One of my colleagues succeeded by it in the removal of a piece of lead, just when, from failure by other means, the attempt was about to be abandoned.

I have a horror of the use of the scoop, so generally employed, because it can only act as a sort of lever, and because I have repeatedly known it do much damage. We have a specimen in the Museum, in which a bean was, by its agency, thrust through the membrana tympani, and produced death by its irritation. The forceps are little better. The plan of syringing is safe, but often tedious and disappointing, and when the foreign body is capable of swelling, it may even do harm.

On behalf of the wire-loop plan, I assert that it is easy, simple, effectual, and free from risk.—*Clinical Lectures and Reports of the London Hospital*, 1867–8, *p.* 221.

DISEASES OF THE SKIN.

84.—ON THE THERAPEUTICS OF CUTANEOUS DISEASE.

By Erasmus Wilson, Esq., F. R. S.

In these diseases there is a cutaneous lesion and very commonly a state of constitutional disorder; hence our remedies must be of two kinds, namely, external, or cutaneous or local; and internal or constitutional. To classify the external or local remedies, we must divide them into alleviatives and stimulants and caustics; while the constitutional remedies are, aperients,

alteratives, and tonics, Thus if we have a cutaneous disease before us, we soothe it to remove irritation; we stimulate when the indication is to restore the tone and function of the skin; and we apply our caustics if the intention be to destroy exuberant or morbid growth. Then in the case of constitutional disturbance, whether primary or secondary, we regulate the secretions, we modify nutrition, and we restore the vital power. You may interpose the remark, that the method which we are now propounding is the method in common use for the treatment of every disease of the body. Our answer is, that it is so; and that the error is to suppose that the disease of the skin has a special pathology of its own, and a special principle of treatment; the treatment of a cut finger and of an eczema is in reality identical. You will observe that we make no mention of specifics, and simply because there are no such things; arsenic is a neuro-tonic applicable to every disease wherein there is a loss of power of the peripheral nervous plexuses and a consequent disorder of capillary circulation and of cell-nutrition. Sulphur in its special usage is a simple fumigatory, destructive of the life of the humble animalcule which represents the cause of scabies, but effecting no more than a variety of other substances could accomplish: for example, common olive-oil, or the seeds of the stavesacre. Tar, again, is simply a stimulant: while the bi-chloride of mercury is both a stimulant and a caustic. There cannot be a question that there is a manner of handling our remedies that is worth your study, and is, in fact, the matter that most demands your attention. The master is known not by the mere excellence of his tools, but by his method of using them; and this, in fact, creates the need for clinical instruction.

The theory of medicine—and the word medicine includes surgery and every ramification of the healing art, just as the word physician is the general denomination of the practitioner of the healing art, for nature knows none of the pigmy distinctions of men—the theory of medicine at the present day is, happily, a very rational one; we no longer talk of humors and humoralism, things of the imagination, mere ideas, and incapable of demonstration, but we refer disease in its aggregate to a *plus* or a *minus* of vital power; our local diseases are dependent upon diminished vitality of tissues, our general diseases upon a depreciation of the vigour of life. And, bringing this method of reasoning down to the diseases which we are now investigating, it may be shown that all our processes have for their object to remove the causes of depression of the vital power on the one hand, and to restore vital power upon the other. The alleviators remove irritants which by their operation upon the peripheral nervous structures depress and exhaust, while the stimulants are direct tonics. And the same may be said of the internal remedies when judiciously employed; aperients and emunctories remove elements which by their excess weigh down the beam of life; they create a waste which instantly becomes the most active impulse of supply; in a word, they are active agents of renovation; and then and at the proper moment, we step in with our tonics, our digestive tonics, our blood tonics, and our nerve and tissue tonics.

We say again, and we can hardly repeat the saying too frequently, that cutaneous disease is a lowered state of vitality, in fact, a debility; a debility of tissue or of the part; and a debility of the entire constitution; and that the aim of our treatment should be to restore the power of the part, and to restore the tone of the constitution. We express an apparent truth when we say, in a particular case, that the constitution is sound, although a local disease be present; but such a statement is neither philosophical, nor is it rigorously true; and it is not true for this reason, that you may add increased vigour even to that which is assumed to be sound on the average; and by the addition of new vigour the local disease will disappear. Therefore, gentlemen, while you should always keep in view, as a paramount duty, the cure of a local disease, you must also endeavour, as a still higher duty, to improve the constitution. There are cases in which you can make no progress with the local disease until the constitution is improved; and we can hardly realize a case which will not get well spontaneously, if we succeed in elevating the vital power.

The LOCAL REMEDIES applicable to cutaneous disease are: water, in a great variety of forms; alcohol, powders, soaps, glycerine, oils and fats, acids and alkalies, vesicants, caustics, cantharides, and certain vegetable and mineral substances; for example: wheaten flour, oatmeal, starch, linseed, poppy, bitter almond, stavesacre, camphor, resin, iodine, tar, carbolic acid, lead, zinc, silver, mercury, and sulphur.

WATER, in its several states of cold, tepid, and hot, simple and medicated, possesses a variety of properties and an equally varied range of utility. As an abluent it serves to cleanse and soften the epidermis; as a lotion it cools; as a fomentation or poultice it warms; it relaxes when hot, and braces and invigorates when cold, and may be made the medium of applying medicinal substances to the skin to modify the tissues or facilitate their absorption by the organism, and this either to a part or to the entire surface of the body. When used to the whole surface of the skin, it constitutes a bath, and the bath may be charged with a variety of substances, and so become a medicated bath; thus we have baths of starch, of oatmeal, of milk, and of gelatine, of iodine, of mercury, of sulphur, &c. Hebra invented a permanent warm bath, in which he kept a patient, afflicted with variola, during the whole course of the disease, amounting to several weeks. One of the commonest, and, at the same time, one of the most popular of the uses of water, is the water-dressing and the poultice. These remedies are essentially relaxing in their operation on the skin; they subdue nervous irritability and muscular contractility, and in this way tend to alleviate the pain and heat of local inflammation. But you will perceive that this state of relaxation may be carried to the extent of producing weakness and debility of tissue, and then the remedy which a few days before was of the greatest utility has gradually merged into a cause of disease. Herein you will see the explanation of a cluster of ecthymatous pustules or small boils rising up around a boil or carbuncle that has been long poulticed; and you will also comprehend an occurrence of frequent experience, namely a kind of permanent eczema, maintained by a water-dressing and oiled silk.

ALCOHOL we employ as a refrigerant for subduing the heat and burning of local inflammation, and especially in the diluted form to which we give the name of evaporating and cooling lotion; it is also a stimulant, and by that property controls and diminishes the relaxing effects of lotions in general. As a solvent of certain substances, such as camphor, soap, and bichloride of mercury, it is of much practical usefulness in enabling us to employ remedies which are insoluble in water alone, and would otherwise be inefficient. We sometimes rub down a drachm of alcohol with an ounce of the benzoated ointment of oxide of zinc for the sake of the cooling effect produced by evaporation; a thin fold of linen dipped in a lotion containing alcohol will reduce the heat and sooth the pruritus of an eczema capitis, a result of no mean consequence in an unreasoning and irritable infant; the combination of alcohol with soft soap and tar, made known to us by Hebra, is a remedy of great value; and the spirituous solution of the perchloride of mercury familiar to all as Gowland's lotion, is also an excellent remedy.

POWDERS are useful to relieve heat and irritability of the skin, and also to absorb moisture; they are cooling and desiccant, and by combination may be made antipruritic and mildly stimulant. We recognise their value in erysipelas, in the popular application of a layer of wheaten flour by means of the dredger; in the starch-powder and fuller's-earth employed in the excoriations and erythemata of children and also of adults; and in the moderately stimulant properties of the pulvis cinchonæ in erythematous burns and scalds. The principal forms of powder suitable to cutaneous purposes are, starch, the pollen of the lycopodium, zinc, calamine, silicate of magnesia, or French chalk; and silicate of alumina and soda, or talc, &c.; and with these may be mixed other remedies, such as camphor, carbolic acid, and perchloride of mercury. Powder forms the lightest kind of dressing that can be applied to the cutaneous surface; it excludes the atmosphere, maintains the normally dry state of the skin, and is easy of removal. But when these conditions are altered, may become an irritant; as in cases where exudation is copious, and

the powder masses together, or where it cakes and dries up into hard and rigid crusts.

SOAP is a detergent and a solvent of the epidermis; it is therefore the means that we commonly have recourse to to remove impurities, such as discharges, crusts, and epidermic and sebaceous concretions and deposits. And it is also a stimulant; and we may remind you that moderate stimulation is equivalent to a corroborant or tonic action; a tonic prescribed for internal use is a stimulant; externally, also, the stimulant is a tonic when properly employed, and soap may be regarded as the natural tonic of the skin. There would be a great mitigation of cutaneous disorders if this truth were accepted generally, and as generally acted upon; for to prejudices against the use of soap may be traced a very considerable number of diseases. Soap is also made available as the vehicle of several other medicinal substances; for example: glycerine, camphor, tar, carbolic acid, petroleum, and sulphur; and the soaps, by these additions, may be soothing and softening to the skin, or stimulant and desiccant, or even irritating. Price's glycerine soap is one of the best of the softening soaps, and the detergent and stimulant principles of soap are well illustrated by the tinctura saponis cum pice of Hebra in its application to the treatment of alphos.

GLYCERINE, from the property of retaining its moisture and resisting evaporation, is very valuable in a dry and parched state of the skin; for the same reason it is an useful adjunct to lotions: it is also important from its property of holding other substances in suspension or solution, and of assuming a semi-solid, or rather gelatinous form, when a small quantity of starch is added to it, and the mixture subjected to a temperature of 240°. The British Pharmacopœia gives to these compounds the name of glycerina; a more classical term is one proposed by Dr. Frederic Farre, namely, glycyria. We have already mentioned to you the glycerine soap of Price's Company, which contains upwards of 45 per cent., or nearly one-half its weight, of the purest glycerine at present manufactured.

OILS and FATS harmonize with the epidermis and blend with its structure; when smeared on the skin, they form a dressing, which, like a varnish, is almost impermeable; it is to a great degree impermeable from within, and therefore it preserves the natural moisture of the skin; and it is equally impermeable to the atmosphere from without. We have been in the habit of comparing a thin stratum of fat with a water-dressing of the lightest and least injurious kind, and we may remind you that it was the chief protection on which the ancients relied for the preservation of their wines. The only word of detraction that can be urged against oil and fat is their tendency to undergo decomposition by exposure to the air, and so to generate the fatty acids which are irritating to the skin; in popular phrase, the fat becomes rancid. But the "vanity of woman," as old Celsus observes, the demand which the fair sex have made from time immemorial upon the inventive genius of man to supply them with the means of improving and securing their beauty, has furnished us with a contrivance to prevent the rancidity of our oils and of our ointments. First used by the French for the perfection of their pomades, gum benjamin was suggested by Alexander Ure to the celebrated house of Jacob Bell for the preservation of their ointments. It was first applied to the oxide of zinc ointment for our purpose, and has since been extended to the lard of which ointments are composed, and equally to oils. The British Pharmacopœia has latterly adopted its use, and we may almost say that no ointment or oil is suitable for application to the skin that has not been previously benzoated. As a maintainer and regulator of the surface temperature of the body, oils and fats possess remarkable virtues and remarkable power; with some of the nations of the world oil is the principal article of costume; and, occasionally, to an undergarment of oil they add a dressing of desiccant powder.

ACIDS and ALKALIES sometimes enter into the composition of our local remedies to relieve irritation and pruritus; sometimes as stimulants; sometimes to prevent the formation of crusts; or as solvents of the surface of the epidermis; and sometimes to remove scales. Distilled vinegar and hydro-

cyanic acid are both antipruriginous; sulphurous acid and acetic acid are stimulants. A soda-bath is sedative and detergent; sapo mollis or sapo viridis is, by virtue of its alkaline composition, an admirable remedy for the removal of concretions and scales; and ammonia is often a valuable stimulant.

VESICANTS are represented by cantharides in various forms—in ethereal and acid solution, and also in solution and suspension in fat. We rarely have occasion to raise a blister; but sometimes, as in chloasmata and melasmata, we are called upon to induce desquamation. And we further make use of cantharides as a means of producing stimulation short of vesication. Vesication may also be produced by ammonia, by creosote, and by the oleum sinapis; but these, like the preceding remedies, we employ only for their stimulant properties.

CAUSTICS are acids or alkalies, or their salts; of the former we have the three mineral acids, nitric, muriatic, and sulphuric, chromic acid, and arsenic; the principal acid salts being the nitrate of silver and mercury, and chloride of zinc. Of these the most important is the nitrate of silver, and next to the nitrate of silver the potassa fusa, either solid or in solution. For certain diseases of the skin, caustics must always be ready to your hand; for example, for lupus, for epithelioma, for angeioma, and for morbid growths; and we will venture to say that you will find none more useful than the caustic potash. Arsenic is sometimes employed as a caustic for cancer; but we believe it to be inferior to potassa fusa and chloride of zinc, and dangerous, from the liability of absorption into the system.

Under one head may be included the VEGETABLE PRODUCTS; wheaten flour, oatmeal, starch, and linseed. Wheaten flour we have already mentioned to you as a remedy for erysipelas. Oatmeal in the form of a thin gruel is a valuable fomentation, tranquillizing and softening. Starch is the principal constituent, the diluent, in fact, of our cooling and desiccating powders; in decoction it is, like gruel, soothing and sedative, whether as a fomentation or a bath; and as a jelly, in its cold state, and enclosed in a muslin bag, it constitutes a valuable poultice. Linseed also is an excellent fomentation when used in decoction, and our best poultice when prepared with the meal.

Other products of the vegetable kingdom are; poppy capsules, bitter almonds, camphor, seeds of the stavesacre, iodine, resin, and tar. A decoction of the capsules of the *poppy* is a valuable sedative fomentation. Emulsion of *bitter almonds*, by virtue of the contained prussic acid, is also a sedative in pruritus. *Camphor*, in powder, soothes the pungent heat of erythema, relieves itching, and is a mild stimulant to the skin; and in the form of a spirituous solution, it enters into the composition of our sedative lotions. The seeds of the *stavesacre* are an efficient substitute for sulphur in the treatment of scabies, and may be used either in tincture or in ointment.

IODINE is a discutient, and is employed in the simple state of spirituous solution or tincture, or in the form of iodic salts of potash, sulphur, lead, or mercury. As a tincture it produces stimulation of the skin and desquamation of the epidermis, and by these properties is useful in the removal of discolorations, such as chloasmata and melasmata, and thickenings of the epidermis; for example, callosities and corns. Its combination with sulphur, the iodide of sulphur, is the active ingredient in an ointment, which is the most effectual remedy we possess in the treatment of sycosis.

RESIN is the constituent of one of our most valuable ointments, the yellow basilicon, for the treatment of broken boils, carbuncles, and chronic ulcers.

TAR, in its varied forms of pine tar, juniper tar, birch tar, and beech tar, is antipruritic and stimulant. As an antipruritic it is combined with soft soap and alcohol to form a lotion; it is also employed for the same purpose as an ointment in a diluted form; but as a stimulant it may be used in its pure state, or as a more concentrated ointment, and applied with more or less friction. In the same group must be included the so-called mineral tar or coal tar, and the Barbadoes tar; for coal tar can only be regarded as the product of destructive decomposition of wood, and coal tar has of late been

adapted to our purposes by incorporation with soap, and also in the compound which goes by the name of liquor carbonis mineralis.

Also intermediate in origin between the vegetable and the mineral kingdom is carbolic or phenic acid, a valuable cutaneous sedative and stimulant. It enters into the composition of a very useful soap; in conjunction with glycerine it forms an antipruritic lotion; and as a lotion, or in combination with ointment, it is the antagonist of pyogenesis. Lately it has been used by Dr. Yates, of Kingston, in Canada, as constituent of an ectrotic ointment in the treatment of variola, and, as he informs us, with remarkable success; and it would seem to be especially valuable wherever a purulent discharge is in process of formation by the skin.

From the MINERAL KINGDOM we derive a store of valuable remedies; for example: zinc, lead, silver, mercury, and sulphur.

ZINC as an oxide is a constituent of our best powder and our best ointment; as a carbonate under the name of calamine, it is also used as a powder and an ointment; and as a chloride it constitutes an useful lotion and caustic. The oxide is desiccative, protective, and sedative. The ointment, in its benzoated form, is also protective and sedative; while the chloride, in various degree of dilution, is stimulant, anti-pyogenic, and destructive of lowly vitalized cell structures.

LEAD is sedative in its more useful forms, namely, as an acetate, constituting the saturnine lotion of various degrees of strength; in the state of carbonate, and used as a desiccant powder; and also as a carbonate, and in combination with benzoated lard, constituting an ointment.

SILVER, in combination with nitric acid, and producing a nitrate, is a remedy of considerable importance; applicable in solution in water or nitric ether of every degree of strength, and applicable also in its solid form. According to the manner of its use, it may be a sedative, a stimulant, or an irritant. In an irritable state of the tissues no remedy restores the healthy balance of action and quiets refractory nervous excitement so quickly as a lotion of nitrate of silver. It converts at once the most perverse irritability into a quiescent normal process, and produces the state of calm which is necessary for cure. Hence we find it of service in chronic eczemata, in chronic ulcers, and in local pruritus. The name of Higginbottom, of Nottingham, is associated with its application to erysipelas, apparently on a similar principle; and it is destructive of lowly-vitalized tissues, and thereby assumes the character of a caustic. Hebra advises and uses it in lupus, wherein it not only destroys the crude granulations, but promotes a more healthy nutrition of cell growth. But as a caustic for other than the most trivial purposes, it is nowise reliable; and for epithelioma and angeioma should never be trusted.

MERCURY supplies us with a host of valuable remedies, of which we may enumerate the subchloride and the perchloride, commonly employed in the form of lotion; and the red oxide, the nitrate, the ammoniated, and the red and green iodide in ointment. The lotion of the subchloride of mercury and lime-water we employ in ulcerating syphilodermata. The perchloride of mercury in solution in emulsion of bitter almonds is the famous Gowland's lotion. The ointment of the red oxide diluted with benzoated lard, in the proportion of one to three, is the best possible remedy for pityriasis, and the ointment of the nitrate and ammoniated mercury excellent discutients of chronic eczema. Active inunctions with the mercurial pomade are useful in some forms of syphiloma; the green iodide of mercury ointment is sometimes applied with advantage in alphos; and the acid nitrate is applicable to lupus.

SULPHUR is presented to us as the immemorial cure of scabies, the parasiticide of the acarus scabiei; and is also of value in the treatment of acne, of gutta rosacea, and sycosis. It exists in solution in the liquor calcis pentesulphidi, or solutio sulphuris cum calce, the remedy employed in Belgium for the "speedy cure," the two-hour cure, of itch. As an ointment, we have the simple unguentum sulphuris of the British Pharmacopœia, which is improved in efficacy by the addition of carbonate of potash, and used for a similar purpose. For acne and gutta rosacea the best-known remedy is the

unguentum sulphuris hypochloridi compositum omitted by the British Pharmacopœia, and for sycosis, the most efficient, local application is the unguentum sulphuris iodidi.

THE CONSTITUTIONAL REMEDIES at our command are: antiphlogistics, aperients, alteratives, and tonics. First among antiphlogistics are effervescent salines, which facilitate secretion and allay irritability.

APERIENTS exist in abundant store among the neutral salts, and especially in sulphate of magnesia; in vegetable extracts, such as colocynth, scammony, rhubarb, belladonna, and hyoscyamus; and in the oxides and salts of mercury.

ALTERATIVES are found in sarsaparilla, dulcamara, and tar, in the vegetable kingdom; and among metals, in iodine and mercury.

TONICS also occur in great variety, and with an equal variety of uses; some being *assimilative* tonics, such as vegetable bitters and the mineral acids; some *nutritive* tonics, such as cod-liver oil and phosphoric acid; some *blood* tonics, for example iron; and some *nerve* tonics, such as quinine and arsenic.—*Journal of Cutaneous Medicine, July*, 1868, *p.* 118.

85.—ON THE ACTION OF ARSENIC ON THE HUMAN SYSTEM, ESPECIALLY IN REFERENCE TO ITS USE IN DISEASES OF THE SKIN.

By THOMAS HUNT, Esq., Surgeon to the Western Dispensary for Diseases of the Skin.

[To do justice to the subject, arsenic must be considered as a poison and as a medicine, in order that its safety as well as its utility may be appreciated.]

We may divide fatal cases of poisoning by arsenic into three classes, according to the number of hours or days transpiring before the fatal result. The patient may die in five or six hours, or less, after swallowing the poison; or he may survive it one, two, or three days; or he may die after a protracted illness of several days, or even recover at last.

1. In cases in which the patient dies in two, four, or six hours after swallowing the poison, he dies of *paralysis of the heart*; and the symptoms are, excessive prostration of strength, with frequent fainting, and ultimately fatal deliquium. Here the dose of arsenic is generally very large. The medical attendant, finding his patient pale and pulseless, seldom dreams of arsenical poisoning, but suspects internal hemorrhage. But the *post-mortem* reveals nothing of this kind, and the patient is buried, nobody for a moment suspecting that he has been poisoned; for there is no vomiting, nor diarrhœa, nor even pain in the abdominal organs, and yet the patient may have taken two or three ounces of arsenic. These cases are rare, but they certainly do occur.

2. When the patient survives a poisonous dose of arsenic for one, two, or three days, he dies at length, not of paralysis of the heart, but *of inflammation* of one or more of the abdominal viscera; and here, the dose being smaller, the symptoms are very different. There may be slight faintness in the first instance, but the grievous complaint is pain in the stomach, which soon becomes excruciating. The patient complains that there is a fire burning within him. He retches and vomits constantly, especially after drinking, which can scarcely be avoided from the urgency of the thirst, and the dryness, heat, and intense constriction of the throat. The belly is tense and tender, and sometimes swollen. Hoarseness and difficulty of speech commonly follow. Diarrhœa, or tenesmus, or both, are present. The mouth and lips, and nearly all the mucous and serous membranes of the body, partake of the inflammatory action. After a few hours twitches of the muscles, or convulsions, occur, with tremors and severe cramps in the legs; the pulse is rapid and feeble, the hands and feet livid, the countenance anxious and collapsed, and afterwards clammy sweats, delirium stupor, and coma usher in the fatal event. These are the ordinary symptoms of an ordinary dose of the poison.

3. In cases where the patient survives the dose a much longer time, and

yet generally dies at length, the cause of death is to be found, not in the heart, nor in the stomach or bowels, but *in the nervous system*. The symptoms are inflammation in the first instance, but not of a fatal kind; secondly, *coma*, with a peculiar palsy of the arms and legs, as if from lead poisoning; and then, thirdly, symptoms of epilepsy in one case, of tetanus in another, of hysteria in a third, and of mania in a fourth. The patient has generally taken but a very few grains of arsenic in these cases, or he has partly got rid of it by vomiting. He may die at length of tetanus or epilepsy, or he *may* recover. If slow poisoning by arsenic ever occurs, these are its symptoms and course.

Here, then, are three classes of cases of poisoning by arsenic, in which (according to the dose taken, and its solution in the stomach) we have distinctly three different sets of systems, and three widely diverse causes of death, as well as three dates, periods, or intervals between the entrance of the poison into the stomach and the fatal result. Thus, we have death occurring within a very few hours, from the failure of the heart's action; death occurring within two or three days, from extensive inflammation; and, lastly, death occurring within two or three, or more weeks, the cause being fatal disturbance of the nervous system.

Every practitioner of medicine should store within his mind a ready impression of these facts, as, at a coroner's inquest or at a trial for murder, the life of an accused person may be at stake, and the judge and jury of necessity place reliance on the medical evidence.

Still, it must be obvious that the foregoing divisions are rather arbitrary than natural, and, though they will be very useful as land-marks, they will not apply to every case; for there often occurs an intermediate case, in which the dose, the symptoms, and the date of the fatal event all prove exceptional. For instance, the victim may suffer severely at one and the same time both from the depressing and irritant effects of the poison; or he may possibly die suddenly without any well-marked symptoms at all.

The result of the whole is, that it is as well to exercise great caution, and to be somewhat reserved in our evidence until a *post-mortem* examination has decided whether arsenic is deposited in the tissues in palpable quantities or not.

In *medicinal* doses the action of arsenic presents quite a new field of inquiry; and happily the subject has been investigated of late with great care and attention, and the results are not only highly interesting and satisfactory, but so unexpected and astonishing that the profession has scarcely yet accepted them as facts. We are speaking now of the physical, not the therapeutical, action of minute doses; and we are speaking of *real* doses, not of hypothetical or homœopathic doses, commonly called "infinitesimal." We have nothing to say of things which *are not*.

Now let us suppose a patient to take a medicinal dose of the mineral, say five minims of Fowler's solution thrice a day for a week. What should we expect? What *do* we expect? What does the profession expect? What does the patient expect? Just what never occurs—sickness, griping, purging, and other signs of irritation in the digestive tube. For the first week there is very rarely any sensible effect whatever produced. At the end of the second week a slight weakness of the eyes is sometimes complained of, the conjunctiva being a very little inflamed. The effects of the medicine do not accumulate beyond this, and by reducing the dose a little, we shall allow the eyes to recover, often without at all hindering the therapeutic effect. There now soon occurs a sense of warmth in the extremities, and a general feeling of improved health and invigoration. Some patients become plump under such a course, others feel in high spirits, and are conscious of an improved appetite. Many say, after a six months' course, that they "never felt so well in their lives." A few, however (and these are mostly nervous or fanciful subjects), complain of disturbed rest and all manner of queer feelings. This is especially the case where the patient knows he is taking arsenic, and *thinks* he is being poisoned by it. After nine or ten months have elapsed, it is common for the soles of the feet, and much

more rarely the palms of the hands, to become a little hard and corny. The epithelial scales are thickened, and sometimes the feet are tender, as after a long walk. In persons of fair complexion we often find at length that those parts of the surface which are protected by the dress assume a sort of unwashed appearance, and a few fine scales may be brushed off (Pityriasis arsenicalis). Very rarely indeed a few red papules appear here and there; but eruptions produced by arsenic are trifling, and by no means worthy of serious notice. This is an honest account of the average effects of arsenic in a proper medicinal dose, an average deduced from a survey of upwards of fifteen thousand cases, recorded not in the memory, but in about twenty large volumes of manuscript, supplied chiefly from dispensary practice, the patients being generally ignorant as to the medicine given them, and the effects to be expected from it. Some of them took the medicine almost continuously for seven years together, and not one with a result to be regretted.

The effects of medicinal doses are therefore most curiously diverse *in kind* as well as degree from the effects of poisonous doses. Poisonous doses are almost always fatal; medicinal doses never. As a poison arsenic is depressing in the extreme. It may produce paralysis of the heart, nausea, vomiting, stupor, epilepsy; as a medicine it is tonic and invigorating, excites moderately the action of the heart and arteries, quickens the appetite, promotes digestion, often cures intermittents, and has been known to cure epilepsy. As a poison it irritates the bowels, and produces diarrhœa, colic, and dysentery. As a medicine it never excites inflammation, scarcely ever diarrhœa, but has often been observed to restrain the undue action of the bowels; nay, it has been seriously proposed as the best remedy for cholera. Of this, however, the writer has no evidence to offer, nor would he be inclined to make the experiment, for this among other reasons, that a cholera patient would probably die some days before so slow a medicine could act at all.

Such, then, are the physiological effects of arsenic in proper medicinal doses. And these are well known to hundreds of practitioners who use it every day *secretly*, and, so far, perhaps, *wisely*; for patients do better under it when they are kept in profound ignorance. There is, however, in the profession a wide-spread prejudice against it, founded certainly not upon experience of its use; for no man would be afraid of it if he, like the writer, had administered not less than 500 gallons of the arsenical solution in ten years in dispensary practice alone.

But perhaps no individual experience ought to settle such a question as the safety of arsenic as a medicine. Some men are wonderfully lucky. We may, therefore, inquire further. And, first, as to the *reason* of the thing. Will analogy teach us nothing? Let it be noted that the medicinal dose of arsenic is equivalent to about $\frac{1}{24}$ of a grain of arsenious acid. But the smallest dose of this acid which is recorded as having been fatal is two grains, or about fifty times the quantity generally required in medicine. Now, imagine the effects of fifty proper doses of *any other medicine* administered in one dose. Think of 200 grains of calomel, 100 grains of opium, 30 ounces of sulphate of magnesia, 30 drams of magnesia, a dram of extract of colchicum, 50 grains of tartarized antimony, half a gallon of castor oil! Who would not rather trust his stomach with two grains of arsenic than with any of these unheard-of doses of the commonest medicines? One is really ashamed of putting so simple a proposition before the profession. But if the medicinal dose of a medicine be fifty times less than the poisonous dose, how in the name of common sense can it be unsafe? What can professional science be worth if we are to humble ourselves to such a bugbear as this?

But, lastly, let us appeal to established facts. In the year 1848 the President and Council of the British Medical Association (then called the Provincial Association) undertook the task of making extensive inquiries among the members of the Association, who had certain questions presented to them in the Journal, as to their experience in the medicinal use of arsenic. And these questions were reprinted and addressed to many members of the profession unconnected with the Association who were believed to have em-

ployed arsenic very largely in medicine. The results of this important inquiry were published in the "Transactions" of the Association (vol. xvi., part 2), and in this "Memoir" is embodied the experience of seventy-five practitioners who had used arsenic largely as a medicine, and whose cases amounted in the aggregate to several thousands. Yet, in their replies to special inquiries, it appeared that not one of these practitioners *had ever found the medicine either fatal or permanently detrimental to health.* We are tempted to ask, where shall be got such an amount of evidence as to the safety of any other medicine?

But there are two questions which remain for discussion:—1. Whether arsenic is not a *cumulative* poison, and dangerous on that account? 2. What if an overdose be administered, medicinally or by mistake; is there no danger then? These questions can be settled by an appeal to facts.

1. Arsenic is *not*, as was once believed, a cumulative medicine. On the contrary, there is no mineral salt so rapidly eliminated as the salts of this metal. In proof of this, MM. Danzer and Flaudin found no trace of arsenic in the bodies of animals to which doses of fifteen grains of arsenious acid had been given daily. The bodies were examined *three days* after the last dose. The same result occurred in the *post mortem* examination of a gentleman who had taken arsenic regularly for about a year for the cure of a cutaneous disease. He died of typhoid fever, and had taken arsenic up to within a fortnight of his death. Not a trace could be found in the blood, the liver, or other tissues, which were examined with great care. Neither is it found that the *effects* of medicinal doses accumulate or increase after the first fortnight.

2. As to the consequences of excessive medicinal doses taken by accident or otherwise, these are well marked, but rarely dangerous.

We may now divide cases into five distinct groups.

1. In doses of several drachms or ounces, partially or wholly dissolved, and not rejected by vomiting, we have excessive prostration, frequent and frightful fainting, and death within five (or at most six) hours.

2. In more common cases, where the quantity swallowed and dissolved is perhaps less than a drachm or two, we have heat and burning in the stomach, pain aggravated by pressure, frequent vomiting and violent retching, and inflammation of the whole alimentary canal from the throat to the anus, with diarrhœa, tenesmus, strangury, and irritation of probably all the mucous membranes, then cramps and convulsions, cold sweats, and death in twenty-four hours.

3. When the poisonous dose is very small (from two grains to ten), we have, *first*, symptoms of inflammation of a less severe character, and *secondly*, coma, palsy, epileptic or tetanic symptoms, with or without mania; death occurring after a long protracted struggle of several days, from which now and then a patient has been known to recover.

4. In doses from one-eighth to one-third of a grain, or more, we have quite a different set of symptoms, viz., conjunctivitis, dimness of sight, vesication of palms and soles, darting pains in the head, swelling and inflammation of the joints, pityriasis or lichen, giddiness, nervous agitation or trembling, sleepless nights, sometimes slight gastric irritation or diarrhœa; or, in the larger dose, vomiting. And these symptoms increase in severity in proportion as the course of poison is protracted, but rapidly disappear when the course is terminated. Some or all of these symptoms will be prominent in slow poisoning.

5. In medicinal doses (from gr. $\frac{1}{20}$ to gr. $\frac{1}{10}$) we observe the effects to be never fatal, but generally tonic and invigorating, the extremities become warm, the appetite and the process of digestion quickened, and the patient becomes more active, and sometimes restless at night. A slight horizontal streak of sub-acute inflammation of that portion of the conjunctiva which lines the lower eyelid betokens the dose to be sufficient for all therapeutical purposes; and this dose may be continued, if needful, for several months or years without the slightest detriment to health, and the course may be as safely arrested at any time.

[In the following paper the use of arsenic simply in cutaneous disease is considered. To this question there is a positive and a negative view.]

Arsenic is *not* useful, *first*, in *syphilitic* diseases of the skin; secondly, in *ephemeral* and *exanthematous* diseases; thirdly, in *scabies*.

1. In syphilitic diseases. Certain authors have eulogised arsenic in syphilitic eruptions. We propose to show that this is a mistake. Arsenic is perfectly useless in syphilis, and in every stage of that disease. How, then, comes it that authors of repute have held and published a contrary opinion? Simply thus: a patient presents himself for treatment, with a scaly eruption, which may possibly assume a copper colour. The patient confesses to a primary sore, to an eruption of maculæ, perhaps to a sore throat, and other symptoms of secondary or "tertiary" syphilis. Arsenic is administered, and lo! the scaly eruption magically disappears, and the case is noted as syphilis cured by arsenic. But, unluckily, there is still a tubercular eruption which does *not* yield to the treatment. The patient is questioned, and he tells you that the *scaly* disease had existed from childhood, years before he contracted the primary syphilitic sore, and now it becomes clear that the arsenic has cured the idiopathic lepra, and the syphilitic eruption has remained in statu quo. Such cases are very common.

2. In ephemeral and exanthematous diseases arsenic is not required, nor, perhaps, is it ever useful.

In the ephemeral class, including lichen urticatus, lichen tropicus, or eczema solare (both common in this hot weather), including erythema evanidum, herpes in its various forms, especially herpes zoster, arsenic is useless. Neither is it useful in the eruptions produced by specific poisons—lichen sulphuris, lichen picis, lichen copaibæ, arsenicalis, or cubebæ; nor, in short, in any eruption which can be traced to either a local or a specific cause. Neither is it useful or necessary in those forms of prurigo which arise from ascarides, uterine irritation, or other obvious and removable causes. Nor is it useful in the exanthemata, or in other acute or ephemeral affections of the skin. In scabies it is also useless, though it has been known to do good in the lichen produced by the excessive use of sulphur.

With these important exceptions, we venture to assert that arsenic is not only useful, but essential, and almost unexceptionably successful, when properly administered, in all cases of chronic idiopathic affection of the skin, including lichen simplex, lichen agrius, prurigo, chronic erythema, impetigo, porrigo, alopecia, ecthyma, rupia, lepra, psoriasis, pityriasis, ichthyosis, eczema, verruca, acne, sycosis, lupus exedens, nævus araneus, ringworm, phtheiriasis, &c., &c., provided always and in all cases, that it be administered discreetly, perseveringly, and with such adjuncts—purgatives, alteratives, tonics, or eliminants—as the case may require. And we may add that it is especially useful in those cases of skin disease which depend on uterine irritation or irregularities. If we are asked to explain the modus operandi of arsenic in all this variety of skin disease, we may as well confess ourselves, after long experience, unprovided with an answer. Shall we say that arsenic has a specific action on the skin and its appendages? Its action on the hair-follicles would seem to confirm this idea. Again, its ackowledged power over intermittents in each attack of which remarkable class of diseases the skin is primarily affected, would seem to corroborate the theory. But above and beyond this, arsenic is the most powerful of all tonics, curing ague often where quinine has failed, and often curing neuralgia when everything else has failed; and this tonic power over chronic disease may partly explain its influence over chronic cutaneous disease.

But here a question arises,—Are not chronic skin diseases certain forms or symptoms of blood disease? And may not a certain supply of arsenic to the blood chemically correct its morbid condition? These are questions well worthy of experimental inquiry, and we throw them out as problems which should attract the attention of our devoted physiologists and chemists, whose delight is to spare no pains in researches such as these.

So much for the diseases in which arsenic may be expected to be useful. But there are certain *conditions of health* which greatly modify the indica-

tion presented by the *nominal* disease. For arsenic is not a specific for certain forms of skin disease, in the same sense as sulphur for scabies. The very diseases which are generally most ready to yield to arsenic, such, for instance, as lepra, psoriasis, and eczema, may, and frequently do, present themselves under conditions of health which forbid the administration of arsenic. What are these conditions? The question is important; for if *they* be overlooked, there is no prospect of success. They are chiefly of three kinds: organic visceral disease, acute cutaneous inflammation, and a highly irritable state of the nervous system. In all these conditions the use of arsenic is generally objectionable, and unless the health of the patient can be restored to a normal condition, arsenic can accomplish no good, and it may do harm. In addition to these, there are several forms of disease, mild and harmless in their nature, perhaps, but which, nevertheless, counter-indicate the use of arsenic. These are nearly all of them disorders of function or impaired secretion, or imperfect nutrition. They may be comprehended under one word—cachexia.

It is not the purpose of this paper to show how these deviations from health are to be treated, in order that the system may be reduced to a condition favourable to the exhibition of arsenic. We assume that organic visceral disease will not be overlooked, that no practitioner will think of administering arsenic in tubercular lung disease, nor in any other organic lesion, nor in acute affections of the skin requiring depletion and low diet, nor in such a highly irritable condition of the nervous system as would forbid the use of any mineral poison, nor, lastly, in a state of the system in which there is impaired, deficient, or excessive secretion, imperfect nutrition, or a marked deficiency of balance between the powers or actions of different organs. These must all be corrected by well-known appropriate treatment before arsenic can be depended upon as an agent in the cure of cutaneous disease.—*Journal of Cutaneous Medicine, July and October* 1868, *pp.* 144, 249.

86.—ON ANIMAL PARASITE DISEASES OF THE SKIN.

By Dr. Balmanno Squire, F. L. S., Surgeon to the West London Dispensary for Diseases of the Skin.

It may appear surprising that so mysterious, so severe, and so obstinate a disease as prurigo, should nevertheless so long have remained a mystery, and this may seem a reasonable cause for mistrusting our conclusions; but a consideration of the habits of the pediculus will, we think, sufficiently account for the fact of the constant presence of this parasite in cases of prurigo having been generally overlooked even for so long.

On stripping a person affected with prurigo, it would scarcely occur to any one who was unacquainted with the fact that the disease was produced by a pediculus. The pediculi are rarely numerous enough to arrest the eye, and, more than this, even a careful scrutiny of the skin, including in the survey the parts of it that are the most affected with eruption, will in the majority of cases fail to detect the presence of a parasite—not even a *nit* is to be seen on any part of the skin or on any of the hairs growing from it. Now the head-louse (pediculus capitis) and the crab-louse (pediculus pubis), in cases where the insect itself is not readily to be found, may always be readily detected by means of the nits attached to the hair of the part they inhabit. It is scarcely to be wondered at, then, that the part played by the pediculus corporis should have been so often overlooked. The parasite dwells not on the skin, but on the underclothing. It is on the inner surface of the undermost article of clothing, whatever it may be, that the parasite is to be sought for, and here it is not always very easy of discovery. As already stated, the pediculi are rarely to be found in numbers; and a very few of them are capable of causing very severe irritation. A careful investigation of the patient's shirt may lead to no result, and yet his disease may be due solely to the pediculus. As we have already remarked, the parasite

nestles between the "gathers" or "pleats" of the shirt, or between the folds into which about the waist the shirt is compressed by the waistband The nits of the pediculus are also to be found in the same situations, but occasionally a large cluster of them is to be found at some other part of the shirt.

It should here be explained that the three varieties of louse that infest the human skin vary considerably in their habits. Thus, the pediculus capitis, or head-louse, although it feeds on the skin, dwells on the hair of the head, and also deposits its eggs on the hair—the pediculus corporis, as we have seen, also feeds on the skin, but it dwells on the underclothing, and deposits its eggs on the underclothing—the pediculis pubis likewise feeds on the skin; unlike the other two varieties, it also *dwells* on the skin, but it deposits its eggs, as the pediculus capitis does, on the hair. It is because the body-louse dwells on the underclothing, and also deposits its eggs on the underclothing, that prurigo is so obstinate a disease. Even when, for the sake of cleanliness, efforts are made to destroy the pediculi which are "generated" by it, the means are generally limited to applications made to the patient's skin, and are therefore futile.

Many practitioners acquainted with our views as to the nature of prurigo, have said, "Well, if the disease be due to the cause you attribute it to, I suppose a warm bath ought to cure it." A warm bath, however, has not even the slighest influence in abating the disease, and the reason of this is that the moment the patient resumes his clothes the process of hatching the ova that are sprinkled over the inner surface of his shirt recommences, and he becomes speedily as bad as ever. On this being pointed out to advocates of the warm bath, they have generally modified their proposal by suggesting that while the patient went into the warm bath his clothes should go to the wash, and that after his bath he should put on clean linen. This is a very simple way of dealing with the thing, but unfortunately it is not so easily to be disposed of.

It is well known that the lowest forms of animal life are, speaking generally, much more tenacious of existence than their superiors in the zoological scale. It will not, therefore, appear extraordinary if we assert that the process linen undergoes in "the wash" does not suffice to destroy efficiently the ova of pediculi attached to the linen; but, whether this may seem likely or not, we have ascertained that the going to the wash does not disinfect the linen. The patient, whatever means may be taken to destroy the pediculi, has thus a constant supply of the disease (so to speak) stored up in his wardrobe. Every time he puts on a clean shirt, he puts on, if one may say so, a fresh supply of prurigo—that is to say, he clothes himself in linen studded with ova which only require the genial warmth of his body to mature them into the parasites on the presence of which prurigo depends.

The only way to destroy the ova in the clothes is to bake them, and this unfortunately, with the class amongst which prurigo is most common, is not an easy thing to arrange, since the poor, when affected with prurigo, are invariably treated as out-patients. If, however, there be practical difficulties in the way of radically curing prurigo by the adoption of means that would suffice to cure cases of many years' standing in the short space of half an hour, we may at least seek for the most manageable palliatives.

A due appreciation of the tenacity of life displayed by the pediculus, of the nature of the substances which are really calculated to destroy him, and of the rapidity with which lotions applied to the surface of the body evaporate and disappear, to say nothing of the difficulty of efficiently applying them to the skin, which being always rather greasy, causes them to run off it like rain from a duck's back—these considerations will explain how it is that the "local applications" which "have been praised" are, as Sir Thomas Watson says, "in most cases used in vain." He mentions vinegar, lime-water, decoctions of dulcamara, lotions composed of prussic acid in an emulsion of bitter almonds, a dilute solution of creasote, decoctions of stavesacre and digitalis; continuing this list, he mentions ointments containing mercury, tar ointment, and "a hundred others;" he then tells us

how, in a case which had withstood other treatment, he succeeded by the use of aconitine ointment, and how Mr. Gabb had found a weak dilution of the liquor sodæ chlorinatæ very serviceable.

Now, by the above list, which may be taken as comprising all the local applications most in favour for the treatment of prurigo, it will be found that lotions are more in fashion than ointments, and this circumstance accounts to us for the general condemnation with which Sir Thomas visits the whole batch. Amongst the lotions is mentioned a decoction of stavesacre. Now, we have found stavesacre a most valuable external application in cases of prurigo, but we nevertheless endorse the opinion that the decoction is a most worthless preparation for the purpose. This we shall explain further on. But Sir Thomas also condemns "ointments containing mercury." Now, if we were to agree with him in this, we must needs give up all that we have advanced, for everybody knows how justly mercurial ointment (in the shape of white precipitate ointment) is prized by poor mothers as a sovereign remedy against vermin in their children's heads, and every one knows, too, how speedily mercurial ointment will exterminate crab-lice. However, Sir Thomas modifies his censure, in so far as it refers to mercurial ointment, by the following remarkable note, which it is important to our argument to quote, and which runs thus:—

"Since the republication of these lectures in America, I have been favoured by Dr. Bowling, of Adairville, in Kentucky, with an account of a plan of treatment which he has found eminently successful against this distressing malady, and which ought, therefore, to be made generally known. I extract that portion of Dr. Bowling's obliging letter which relates to this subject:—

"'I have, in the last fifteen years, prescribed for a great number of cases of prurigo senilis, and I can say, with a most rigid adherence to truth, that I have not failed in a single instance to effect a permanent cure. I direct that the affected be sponged for a minute or so with good apple vinegar, and then be allowed to dry. After this they are to be smeared over with the citrine ointment (unguentum hydrargyri nitratis). The applications are to be made twice a day. The cure is usually effected in a week. I have never known the constitutional effects of the mercury to be developed in this treatment, save in a single instance, and then but very slightly.'"

Although we are unable to appreciate the use of Dr. Bowling's apple vinegar, we cordially agree with him in his statement that the application of dilute mercurial ointment is one of the very best remedies in cases of prurigo, and that the *smearing* over of even the greater part of the surface of the body with such an application as citrine ointment is not apt to cause, even after a prolonged use of the remedy, any of the constitutional effects of mercury.

We understand, too, Sir Thomas Watson's success in the treatment of prurigo with "an ointment containing a small quantity of aconitine," although we believe the aconitine had little to do with the cure. The fact is that greasy substances of any kind are more or less efficient remedies in cases of prurigo, and this for the same reason that olive oil or lard, *per se*, is a cure for the itch. The pediculus, like the acarus, breathes through spiracles or little apertures in its exoskeleton, which communciate with its respiratory apparatus. These minute orifices getting clogged by the grease or oil, the insect is speedily asphyxiated.

We have said that, although decoction of stavesacre is useless, stavesacre itself is an efficient remedy. The powder of the stavesacre seeds has long been employed for the destruction of head-lice, and an ointment of the powder has been long known as a very excellent remedy for scabies.

We made trial of the ointment sometime since in a large number of cases of prurigo, and found it decidedly more efficacious than lard used alone. But the ointment, being anything but an "elegant preparation," owing to the coarseness of the stavesacre powder with which it was prepared, we made inquiry as to whether the powder could not be ground finer, and found that, owing to the large quantity of oily matter contained in it, it was impossible

to reduce it to anything finer than a coarse meal (for the same reason linseed when ground becomes linseed-*meal*). We accordingly had the oil removed from a small quantity of the meal by percolation with ether, and found that the meal was then capable of being reduced into a fine powder. We employed this powder in several cases of prurigo, and found it quite inert. On inquiring what proportion of oil had been extracted from the meal, we found that it amounted to as much as one-half (by weight) of the meal. On making trial of this oil suitably diluted with olive oil, we found it a much more efficient remedy in cases of prurigo than either olive oil or lard, and even more efficient than mercurial ointment. It was plain from these experiments that the efficacy of the staveacre depended on its oily constituent, and this accounts for the impotence of a *decoction* of the seeds.

As to the internal remedies for prurigo, "sarsaparilla, alkalis, arsenic, iodide of potassium, opium," they are utterly useless if the cure of the disease be the object aimed at. The arsenic and iodide of potassium may operate, perhaps, in a trivial degree; since, at all events they are taken up into the circulation, are noxious to insect life, and in a very diluted form must reach the pediculi, which, as we know, feed upon the blood. Moreover, arsenic, after its administration has been continued for a long time, gets deposited in small quantities in a metallic state in the tissue of the skin; but the effect of these substances must be very inappreciable, unless they be taken in such quantities as to impair seriously the health of the patient. Opium, it is true, may relieve the distress of prurigo by deadening the sensibility of the patient to the irritation of his skin, but it was never pretended that, for this disease, opium was anything better than a palliative.

Before we dismiss the subject of prurigo, it may fairly be expected of us that we should substantiate our general statement as to the extreme commonness of this disease in public practice. On this head we have to say that, of a thousand consecutive cases of skin disease of all kinds, we found one hundred and sixty-six to be cases of prurigo such as we have described it, the number of cases of scabies in the same enumeration being only one hundred and forty-six; so that, if this calculation be taken as a standard—and it must be conceded that a thousand cases afford a sufficient basis for casting a fair average—we must conclude that prurigo is a commoner disease even than scabies: that it constitutes as nearly as possible one-sixth of the number of cases of cutaneous disease that are met with in public practice, and that with scabies it constitutes about one-third of the total of skin disease in this country. So that, if we take only two of the animal-parasite diseases of the skin (and we have others yet to deal with), we can account for one-third of the persons who suffer with skin disease, and the majority of this third are persons afflicted with the most severe, the most "incurable," and one of the most chronic of the affections to which the human skin (at least in this country) is liable.—*Medical Times and Gaz. June* 6, 1868, *p.* 600.

87.—IODIDE OF SULPHUR IN THE TREATMENT OF PORRIGO FAVOSA.

By Dr. Daniel Donovan, Jun., Skibbereen, Co. Cork.

[The following cases illustrate the beneficial action of iodide of sulphur in porrigo favosa, commonly known as scald head.]

John Riley, aged 18 years, William Riley, aged 7 years, and Patrick Riley, aged 5 years, three brothers, were admitted into the Skibbereen Workhouse Hospital, February 27th, 1868, suffering from porrigo favosa in its most aggravated form. The eldest had been affected for eight years—the second for six years, and the youngest for about twelve months; their heads were covered with mouldy-looking honey-combed crusts peculiar to this disease. In some places where the crusts had fallen off, the integument presented a red-glazed looking appearance, studded here and there with yellow pustules,

and totally devoid of hair; their general health was good, and neither of them had any indication of a scrofulous diathesis.

During two months succeeding their admission into hospital various plans of treatment were adopted, such as the use of sulphur and citrine ointments, corrosive sublimate and nitras argent. solutions, and also painting the diseased surface from time to time with tinct. of iodine. Temporary relief was occasionally afforded, but the disease invariably returned in as bad a form as ever. On the 21st May, the following treatment was adopted, and produced quite unexpectedly a speedy and permanent cure. After softening and detaching the crusts by the application of linseed-meal poultices, an ointment composed of iodide of sulphur, 3i., adeps. ʒiss., intimately mixed together, was ordered to be well rubbed into the diseased patches night and morning. This treatment was continued regularly, and on June 10th, a fortnight after it had been first adopted, a marked improvement had taken place; the formation of fresh scabs was arrested, the red patches of skin had almost disappeared, and hair began to grow from several portions of the scalp which were previously bald.

The three patients were discharged cured from hospital, June 30th, as there were no indications whatever of a return of the disease, and their heads were uniformly covered with hair.

If the iodide of sulphur treatment should prove equally beneficial in most other cases of porrigo, it would supply a very simple means of arresting this disease, instead of having recourse to the internal use of arsenic and iodine, and the application of caustic and poisonous lotions to the skin: the use of which remedies in the case of children, is attended with considerable risk, especially in country districts where one must often rely upon ignorant and careless people to administer them, and therefore must be very guarded how he intrusts to the hands of such persons medicines that might prove fatal, if not carefully given in the prescribed dose, or not used as otherwise directed.

It is not many years ago, before the true nature of porrigo was discovered, when the barbarous plan of applying pitch caps to the scalp was adopted on the Continent, and in some parts of Ireland where the disease was tolerably prevalent. These pitch caps consisted of strips of stout calico, spread with Burgundy pitch, or some other adhesive material, and after being firmly applied to the scalp, they were forcibly torn off in a direction contrary to the growth of the hair, so as to tear the hairs out from their roots; this plan was adopted under the erroneous impression that the disease originated in a morbid condition of the hair bulbs, and not unfrequently either scalped the victim or produced death. In this case, as in many others, microscopic and chemical research have come to the aid of medicine. The microscope has determined that porrigo favosa depends on the formation of low vegetable growths of a fungous nature (achorion schönleinii) in the deeper layers of the epidermis and upon the surface of the cutis, attacking the hair follicles, and causing alopæcia in most cases. Chemical researches have discovered that sulphurous acid in a fluid or gaseous form, and the sulphites, especially the hyposulphite of soda, and the compound resulting from the union of iodine and sulphur, have a sort of special capacity for destroying the vitality of such vegetable organisms when they come in contact with them, and we thus have a rationale to follow out, when applying these remedies to the treatment of porrigo favosa, instead of having recourse to hap-hazard modes of treatment which generally produce more harm than good, and invariably aggravate the sufferings of those who are the victims of the disease under consideration.—*Medical Press and Circular, July* 15, 1868, *p.* 69.

88.—NEUROTIC RELATIONS OF HERPES.

Our readers will peruse with much interest the valuable suggestions of Dr. Handfield Jones in another page of this journal. While those observations are fresh in their minds, we will shortly narrate a case that bears upon

the important question of nerve-influence in the development of disease, and may be taken as a living diagram of the phenomena. A healthy young man, a banker's clerk, perceived on Saturday evening a tenderness in his left groin, and discovered a lump which turned out to be a swollen lymphatic gland. The gland was situated just below Poupart's ligament, midway between the anterior spine of the ilium and the spine of the os pubis. It was not particularly painful; and he knew of no cause that could have given rise to it, unless, perhaps, a blow from the corner of a ledger in walking past his desk.

Forty-eight hours later, namely, on Monday evening, his attention was attracted to an itching sensation over the great trochanter of the same limb; and at bedtime he discovered an oval red blotch about two inches long by one in breadth. At the present time (Wednesday) this blotch is evidently a herpes, composed of a cluster of about forty angry-looking papulæ, not as yet arrived at the stage of vesicles; the patch is red and angry, possibly on account of pressure or friction by his clothes, the seat of the patch being the most prominent point of the hip. With the exception of a single non-herpetic pimple three or four inches above the blotch, there is no evidence of other eruption.

Looking at the two lesions, the tender gland and the blotch of herpes, what is the significance of the appearances? The gland first made itself evident; perhaps a slight blow with the corner of the ledger may have disturbed its healthy condition. The same nerve, the external cutaneous, supplies both points of interest. Was the cause one which affected both organs simultaneously? Or, was the affection of the skin a reflex irritation? Probably the latter. The first motive may have been the blow; the second the bruised gland; the third the irritated nerve; the fourth the reflection of the irritation on the neighbouring skin; a nerve paresis. Dr. Handfield Jones's case tended to show a neuralgia of one nerve, with a cutaneous manifestation of weakened nerve-force in a neighbouring nerve. Ours tends to a somewhat similar conclusion, namely, the reflex relation between a subcutaneous organ and a neighbouring part of the skin; between the deep and the superficial. The subject is a mine of pathological wealth.—*Journal of Cutaneous Medicine, July*, 1868, *p.* 220.

89.—NOTES ON ACNE ROSACEA.

By Dr. H. S. Purdon, Physician Belfast Dispensary for Diseases of the Skin, Assistant Physician Belfast Charitable Infirmary and Institution, &c.

The nose is the common seat of acne rosacea, the integument being of a deep violet colour, covered with elevations which slowly suppurate. The affected skin is thickened and infiltrated, and in chronic cases the alæ are pendulous, granulated, and liable to ulceration, in many instances the superficial veins are enlarged and varicose.

Mr. E. Wilson considers acne rosacea to be an eczematous affection, and Hebra states that "accumulated sebaceous matter often sets up an inflammation of the follicles, which would naturally be termed a folliculitis, but is generally called acne." This observation endorses the statement of Dr. Ross, who looks on acne rosacea as due to a determination of blood to the capillary vessels—a hyperæmia—which leads to inflammation of the sebaceous follicles, which pustulate, but do not mature readily.

Hardy considers acne to be a purely local disease, and, according to Mr. E. Wilson, "Gutta rosacea originates in debility, most frequently assimilative, next nutritive and sometimes nervous, is chronic in duration, and possesses close sympathies with the digestive and reproductive organs."

In gutta rosacea, as well as the other forms of acne, the tongue is generally covered with a white, creamy fur, especially in the morning. When such is the case, the best treatment to commence with is the administration of the sulphates of iron, magnesia, and quinine given in infusion of calumba. This mixture will have the effect of cleaning the tongue, gives tone to the stom-

ach, acts as a mild aperient, and prepares the way for the administration of arsenic. I agree with Mr. Milton that "lowering remedies" are injurious in acne rosacea, which is a disease due to debility, the subjects of it having usually impaired appetites and weakened digestion. Tonic remedies are indicated, and nitro hydrochloric acid in decoction of cinchona has been recommended, especially as it acts on the liver, an organ generally at fault. The internal use of cod-liver oil is also very beneficial. But to cure this disease permanently it is generally necessary to put the patient under a course of arsenic, and which may be commenced as soon as the tongue is clean and the liver in proper working order; the preparation that I usually prescribe is the liquor sodæ arseniatis, given in doses of ten drops thrice daily after food. In some cases where the patients are what is commonly called "bilious," it is necessary to order taraxacum, and the following is a good form for its administration; it also acts as a diuretic:—

℞. Decoct. scoparii, ad ℥viii.; spt. etheri nitrosi, ℥ii.; succi taraxici ℥i. Sig., a tablespoonful three times in the day.

For flatulence, a common complaint amongst these patients, the efficacy of the compound tincture of cardamom is well known, or the following, if the appetite is impaired and depression of spirits complained of:—

℞. Tinct. valerian ammoniat, ℥iss.; quinæ sulphat, gr. xx. Sig., a tablespoonful three times a day in a wineglassful of water.

The nitro-hydrochloric acid foot-bath is also a valuable agent.

In the treatment of acne rosacea by external applications, the hypochloride of sulphur ointment, one drachm to the ounce, is a very valuable application, and stands first on the list in importance, being superior to the iodide of sulphur. The following ointment I have used in several cases with the best results:—

℞. Hydrargyri iodi virid, gr. x.; sulphuris, ℥i.; adeps, ℥i. A little oil of bergamot or bitter almonds may be added to cover the smell of the sulphur. Individuals, the subject of acne after exposure to excess of heat, as over a large fire, are frequently troubled by an increase of inflammation of an acute nature in the affected part. In such cases the constant application of the "glycerole of starch" for a few days is of benefit, and in place of soap the following may be used:—Take of glycerine, by weight, five parts, yolk of egg four parts, mix; this application, which has lately been recommended in the Philadelphia Journal of Pharmacy, is of a very soothing nature, and is of the consistence of honey, a little of which can be applied before exposure to cold, heat, &c.

In inveterate cases, painting the part affected with the solution of the terchloride of antimony for a few seconds, and afterwards applying a sponge soaked in a solution of carbonate of soda, is of benefit, especially when the integument is much thickened; a poultice of rice-flour being applied at night; or Dr. Ross's method of treatment may be adopted instead, which consists in puncturing each separate tubercle, and inserting an ordinary capillary vaccination tube, containing a drop or two of nitric acid. This excites inflammation of the follicles, and thus occasions obliteration. I can strongly recommend this method of treatment, as I have found it successful in many cases where ointments and lotions had proved useless.

It is a common custom to prescribe the bichloride of mercury in the form of a lotion in the treatment of acne; now, if this remedy be persevered in for any length of time, it occasions a scaliness and hardness of the cuticle which is very annoying. Borax has quite the contrary effect; it is equally efficacious, and can be prescribed in conjunction with glycerine and tincture of benzoin.—*Medical Press and Circular*, *June* 10, 1868, *p.* 496.

90.—THE CURE OF LUPUS BY CAUTERIZATION.

By Jonathan Hutchinson, Esq., Surgeon to the London Hospital.

I have for several years employed the actual cautery rather freely in the treatment of lupus, and for some purposes I much prefer it to the fluid

escharotics. It is especially adapted for cases in which there is much swelling or thickness of diseased tissue. Two of the worst cases of "lupus with hypertrophy" which I have ever seen, were under my care in the London Hospital during the past year. In each the whole face was involved, and with extreme disfigurement. We pursued the same plan in each. The patient was put under chloroform, and the actual cautery freely used, the point of the iron being thrust deeply into the swollen tissues at many parts. I was particularly careful to cauterise the edges of the patches. We obtained admirable results in both cases, and results which delighted the patients. One of them came to me from the country a year later to show her face, and the condition surpassed anything that I could have expected. There were no ulcers or scabs remaining, all was soundly healed; the swelling was greatly reduced; and in most parts the cicatrix was pale and healthy. Two or three applications at intervals of a month are usually needed. The good effects must not be expected quickly; for a while the state appears to have been made worse, but after some months the advantage gained becomes apparent, and scars take the place of ulcers. The actual cautery causes very little pain afterwards, much less than nitric acid or chloride of zinc.—*Clinical Lectures and Reports of the London Hospital*, 1867–8, *p.* 218.

91.—ON THE THERAPEUTIC VALUE OF OIL AND WATER IN THE TREATMENT OF SKIN DISEASES.

By Dr. John Hughes Bennett, F.R.S.E., Professor of the Institutes of Medicine, and Senior Professor of Clinical Medicine in the University of Edinburgh.

The skin, as is well known, is furnished with two kinds of glands for the purpose of keeping it soft and pliable—viz., sebaceous and sudoriparous glands. While the excretions they pour forth serve other important purposes among the general uses of the economy, there can be little doubt that they have a special action on the skin itself. Further, their diminution or suppression is a circumstance that materially influences the progress of various diseases which attack this important organ. Observation has induced me to believe that there are some of these which more especially affect the oily, whilst others injure the watery secretion. For example, prurigo, lichen, and the scaly diseases are accompanied by dryness of the skin, whilst eczema and impetigo are accompanied by excessive moisture of the surface. Be this as it may, experience has convinced me that there is a class of skin disorders which are readily cured by applying oil or grease constantly to the surface, whilst there is another class which require a similar application of water. Moreover, I believe, although innumerable ointments and lotions have long been employed in cutaneous diseases, that the active agents in all of them, with few exceptions, are not the drugs which they hold in suspension or solution, but simply the oily or watery matters which constitute the bases of these preparations. The establishment of this doctrine, and the careful discrimination of the diseases or textural alterations which require the one remedy or the other, must not only simplify but give greater precision to our therapeutical efforts for their proper management.

Indications for the employment of oil.—In all cases where there is excessive dryness of the skin, inunction with oil or grease is necessary. For eruptions which are essentially dry in their nature, such as prurigo, lichen, psoriasis, lepra, pityriaris, favus, &c., oil or grease are essential remedies, and have long been used in the form of various ointments. Pure oil, though beneficial when friction is desirable, and used as a liniment, is too thin and too easily removed from the skin to produce a permanently emollient effect on indurated epidermis. Hence grease or fat, that is, inspissated oil, has long been employed as ointment. Even this, however, rapidly melts on the surface of the warm skin, and is soon rubbed off, or absorbed by the clothes or substances on which it is spread. This is corrected by mixing with it various dry powders, such as sulphur, oxide of zinc, calamine, &c. These give to the fat a con-

sistence which renders its action permanent, and prevent its rapidly melting or being too readily lost or absorbed.

I have long satisfied myself that the various powders mixed with fat act mechanically by thickening it, and exert no other therapeutical action. Sulphur ointment, for example, is an excellent application in scabies, because lard thickened with sulphur is more tenacious, more readily blocks up the follicles and grooves inhabited by the itch insect, and thus induces their more perfect asphyxiation. But that sulphur exerts any specific action, either on the insects or on the human economy, is disproved by numerous facts. In the same manner, the oxide of zinc, or white precipitate ointments, are excellent applications in prurigo or lichen; but that zinc or mercury are the active agents which cure is disproved by the circumstance that simple lard will in those diseases, as in scabies, produce, though more slowly, the same effect.

In the scaly eruptions, however, more especially psoriasis and lepra, the admixture with the lard of pitch or tar is essential to success. These substances unquestionably contain a principle which exerts a remarkable local action in the removal of these diseases. I say local, because I have given pitch pills and infusion of tar in large quantities internally without causing any effect whatever. Neither has creasote nor carbolic acid any influence on these scaly eruptions. No remedies probably are so beneficial in relieving pruritus in the skin, especially creasote mixed with ten times its bulk of oil; but in psoriasis they are of no avail. Pitch combined with lard, therefore, is essentially the remedy in squamous diseases of the skin.

It is now twenty-seven years ago that I pointed out, as the result of a series of investigations into the parasitic fungi growing on the skin, that such growths seldom flourished when deprived of access to the air. I therefore proposed, instead of applying various ointments to the scalp in cases of favus, first, to remove the crusts by means of poulticing, and, secondly, to keep the clear surface covered with oil. So long as this is done the head can be kept free from the disease. In recent cases, after six weeks or two months, a permanent cure is not unfrequently produced. In chronic cases, though a cure is never readily obtained, the offensiveness of the disease and all irritation is at once removed. In 1840 I watched with great interest the results of the depilatory treatment carried on in the Children's Hospital, of the Charity Hospital, in Berlin, by Professor Barez. Although two old women were constantly employed there pulling out the hairs from the scalp in cases of favus, in no one single instance did I see a permanent cure effected. The practice has been revived by Bazin and others, but such is the difficulty of thus eradicating the hairs in the human scalp, and such is the tediousness and pain of the treatment, that I do not anticipate much success from its employment. It has been adopted by Dr. McCall Anderson, of Glasgow, in the Skin Dispensary of that city. A few of his cases, said to have been dismissed cured. have found their way subsequently into my Clinical Skin Ward of the Edinburgh Royal Infirmary, with their heads covered with favus. I mention this merely to show how very difficult it must be in hospital and dispensary practice to determine whether a permanent cure has really been produced. Although, therefore, I have tried, and continue to try, every kind of treatment that has been proposed in my Clinical Wards, for the cure of favus, my conviction is that, after removing the crusts, the best is the simple application of oil, combined, in scrofulous children, with good nourishment.

Indications for the employment of water.—In all cases where there is excessive moisture on the surface, originating in vesicular, pustular, or ulcerative diseases, the constant application of water is necessary. I say *constant* because occasional applications by means of lotions or of baths are of little service. For this purpose lint well saturated in water is first applied to the affected parts. This must be covered with oil silk or gutta-percha sheeting, that should well overlap the lint below so as to prevent evaporation. The whole must be kept in its place by a bandage, or the application of strings, which is often a matter of great difficulty. Patients are

very slow in accepting the idea that *constant* moisture of the part is absolutely necessary, and they seldom so apply the upper covering in such a manner as to prevent evaporation from the lint below. The result is, it becomes dry, sticks to the inflamed surface, and is a source of irritation rather than of comfort. Hence vigilant superintendence and frequent visits are requisite in order to watch the progress of the case. Even in the hospital, constant care is necessary to see that nurses properly cover the eruption; and when, as sometimes happens, this task is made over to the patients themselves, it almost always fails.

There are some portions of the surface which it is very difficult to keep moist and well covered, such as the face and axilla. But by carefully adapting lint and gutta-percha sheeting, attaching strings to the edges of the latter, to keep the whole in its place, and the covering close to the skin, so as to prevent evaporation, I have never failed in ultimately carrying out my object. For the face it is necessary to construct a mask, having apertures for the eyes, nose, and mouth, and even then it is difficult to exclude the air, especially at the angles of the mouth. When the eruption is very general over the surface, tepid baths continued as long as possible must be had recourse to. Hebra has caused some of his patients to continue in them for weeks together, but of the arrangements whereby he has been enabled to accomplish this I am ignorant.

The effect of the moist application to the acutely inflamed surface, is soon to remove all local irritation, and especially the irritation of smarting, so distressing to the patient. It also softens and removes the scales and incrustations, which in themselves often tend to keep up the disease, and prevent cleanliness of the surface. After a time the indurated parts begin to soften; the margins of the eruption lose their fiery red colour, and merge into that of the healthy skin, and, finally, the whole surface assumes its normal character. In the chronic impetigo, which attacks the chin in man, as well as when the scalp or other parts covered with hair are affected, it will be best to remove the crusts, in the first place, by poultices. It is then necessary to shave the parts every other day with a very sharp razor, using flour and warm water as a lather, and not soap; or a pair of sharp scissors with flat blades may be used to cut the hair close to the skin. If this be not carefully attended to, the short thick hairs prevent the application of moisture to the skin, a space is left between it and the lint, in which the discharge collects and concretes, and no progress towards a cure is produced.

This treatment is applicable to eczema, herpes, pemphigus, impetigo, ecthyma, and rupia. In the last case the ulcers, which appear on the disappearance of the crusts, should be treated as isolated sores with water dressing.

The water treatment of these diseases, now described, was first recommended by me in 1849, and will be found detailed in my Clinical Lectures, 5th edit., pp. 837, 839. I then and still cause to be dissolved in the fluid a small amount of alkali—℥ss. of sodæ carb. to a pint of fluid—which renders it emollient and more serviceable in dissolving the purulent crusts. The tendency which so strongly prevails to attribute therapeutic action to drugs rather than to hygienic means, caused many to attribute the good results to the influence of the alkali, and by some it has been called the treatment of eruptions by alkaline washes. But I have been satisfied from the first it is neither the alkali, nor as a wash, that it is serviceable, but that simple water, if only *constantly* applied, is all that is truly necessary.

Long experience in the treatment of skin diseases, both in hospital and private practice, has now convinced me that the really active agents in the treatment of those referred to are simply oil and water, if properly applied in appropriate cases. I have also observed that while watery applications have no effect on the dry eruptions, so greasy substances seldom fail to exasperate such as have fluid discharges. A correct diagnosis, therefore, is of the utmost importance. I have frequently had occasion to see in the hands of others much time and trouble lost in applying water to a scaly eruption, and an acute eczema rendered most painful and intense by having

pitch or other irritating ointments applied, under the mistaken idea that it was psoriasis. There are certain chronic conditions, however, of originally moist eruptions, where dry induration of the skin is caused, and the unguents are serviceable. To give a description of the forms and stages in which sometimes one or both may be useful is impossible. Nothing but a lengthened experience of the treatment and familiarity with the appearances of cutaneous diseases under varied conditions will suffice for this. But I have no hesitation in recommending the views and practice now described to my medical brethren, not only as a simple but as the most efficacious method of removing the troublesome disorders referred to.—*Practitioner*, *Oct.* 1868, *p.* 211.

MIDWIFERY,

AND THE DISEASES OF WOMEN, ETC.

92.—NEW SPECULUM.

The engraving represents a self-holding Vaginal Fistula Speculum, which has been constructed by Mr. Foveaux, of the firm of Weiss and Son. That such an instrument is wanted can be attested by those who have had to hold the duckbill speculum in protracted and difficult operations. Several contrivances have been devised for this purpose, one of them a special and complicated operating table, but none of them have given satisfaction in this country. The instrument now under notice and depicted here, is applicable in all the various positions for operation in vaginal fistula. It has now been twice used by Mr. Spencer Wells, no assistant being present on the last occasion, and it was found to answer its purpose most effectually. Its mode of action is very simple, the speculum blade or vaginal depressor, of which there are three sizes, being steadily held in the desired position by a counter-pressure arm, which takes its bearing on each side of the spinal column. A screw adjustment approximates these two parts of the instrument in a parallel direction, while the angle of the apex of the speculum, as also that of the counter-pressure arm, can be regulated by small screws.

The instrument is, at the suggestion of Mr. Wells, made entirely of German silver, for the greater facility of cleaning it. One or two napkins serve as padding for the counter-pressure arm.—*Lancet, Oct.* 17, 1868, *p.* 513.

93.—THREE CASES OF PUERPERAL CONVULSIONS COMING ON AT THE COMMENCEMENT OF LABOUR.

By Dr. James Cappie.

[The following paper was read before the Edinburgh Obstetrical Society.]

Case 1.—On the morning of the 5th April, 1862, I was sent for to assist my friend, Mr. Gibb, in a case of puerperal convulsions. Mrs. C. had fallen on the floor in a fit at eight o'clock the previous evening, and since then severe convulsions had continued to come on every half-hour. When I saw her at two a. m., the point of the finger could hardly be introduced into the os uteri, and there did not appear to be any uterine contractions. I punctured the membranes with a common pencil, and tried to dilate the os with the finger, but with little success, on account of the want of expulsive efforts. Chloroform had been freely administered before my arrival, but the fits continued to recur regularly every half-hour. The condition of coma between them was so deep that she could not be made to swallow anything. A glance at the dirty pale, almost anæmic, countenance of the patient was sufficient to convince us that bleeding to any extent was not to be thought of. I left her, with instructions I should be sent for if pains appeared to commence. I was sent for at six a. m., and found the os slightly dilated, and the pains very slight. I again tried to dilate with the finger, and succeeded till it was about the size of a crown piece. The case now appeared very urgent. It was obvious that unless the patient was speedily delivered, she would soon sink from exhaustion. But the vagina was not relaxed, and the distinction between the internal and external lips of the os was not obliterated; that is to say, the parts were in the condition in which most eminent authorities insist that instrumental interference is not to be thought of. Still, such interference seemed to be the only chance left to the patient, and I determined to attempt delivery. In the manner to which I shall more particularly allude afterwards, I succeeded in applying the forceps; then, by making cautious and intermitting traction on the head, and at the same time supporting and pushing back the lips of the os, I got the latter gradually to dilate. After the head had passed into the vagina, the child (dead) was born in a few minutes. This was at eight a. m., and the patient had only two fits from that hour till four p. m., after which they did not return. In the forenoon she had a turpentine injection, which roused her sufficiently to enable her to swallow a little brandy and water, but the comatose condition continued the whole of the next day. Small quantities of stimulants and beef-tea continued to be administered to her, and after consciousness returned, her progress towards convalescence was steady. I may mention that this patient had convulsions in her first confinement; that, according to her husband's statement, she was then largely bled without the frequency of the fits being affected; and that, though they had continued a much longer period in her present confinement, her recovery this time was as satisfactory as in her first.

I was sent for to see this patient again a few months afterwards, as she had taken a convulsion fit. She was in the third month of pregnancy, and on examination I found the ovum in the vagina. After it was taken away there was no return of the convulsions.

Case 2.—On the morning of Sunday, 29th March, 1864, I was sent for to see Mrs. M'L., then in the beginning of the eighth month of her first pregnancy. I was informed that she had been obliged to rise about two o'clock on account of severe headache; that, to relieve this, she had allowed cold water to run from a cistern on her head for a few seconds, and that at four o'clock she was seized with a fit of convulsions. When I saw her, consciousness had returned, but as she was telling me how she had been feeling, another fit came on. After this, consciousness was not for the time recovered, and the fits recurred every half hour. I immediately ordered the hair to be cut off, and leeches to be applied to the temple. I returned at seven a. m., and found the patient as I had left her—unconsciousness persistent and

deep. and the fits returning regularly. Drew off a small quantity of water, which I found to be albuminous. I then cupped over the loins, and took away more than a large soup-plateful of blood, and afterwards administered chloroform; but the frequency of the fits was not in the least affected by these means. I made occasional examination, but the os uteri showed no tendency to dilate till five o'clock in the afternoon, when I could introduce the finger within it. On account of its rigidity, and the unrelaxed state of the vagina, the efforts to dilate it were fatiguing for the fingers, and it was half-past seven before I could venture to apply the forceps. This, however, I accomplished before the os was half-dilated. I then set to work, and, in imitation of the natural pains, made intermitting traction on the head, and at the same time continued to dilate with the finger. The child (dead) was born at ten o'clock. From four in the morning till this time the convulsions had been wonderfully regular. Whenever the time was noted, the interval was never above a few minutes more or less than half an hour. After the second fit complete insensibility continued between the fits. From ten o'clock till half-past two next morning she had four seizures—scarcely one in each hour; then she had other four between 2.30 and 11 a. m.; after which they never returned. Altogether she would have forty distinct epileptiform seizures—the most of them severe. In the afternoon her breathing became quiet, and except that she could not be roused from it, her sleep appeared natural. In the evening she was able to swallow a little, and the next two days she readily took in whatever was given to her, but it was Thursday before she looked about her and attempted to speak. So speedy, however, was her convalescence after this, that on Saturday she was sitting up in bed to her meals and feeling quite well. Thirteen months afterwards, I again attended this patient, when she miscarried at the six months. During pregnancy she had frequent headaches, but no albuminuria. The kidneys were kept active with acetate of potass. There was no return of convulsions. She has been repeatedly pregnant, but miscarries at the sixth or seventh month from diseased placenta.

Case 3.—M. D., aged 30, was admitted to the City Poorhouse on Saturday, 11th April, 1868. She supposed herself to be near the end of the ninth month of her fourth pregnancy. On the Sunday forenoon she complained of headache, for which she kept her bed, and at mid-day she had a convulsive fit. The nurse, thinking she might be subject to epilepsy, did not send for medical assistance. The fit soon passed off, leaving the patient drowsy. She got a dose of castor oil, which operated freely, and during the two following days she was going about and feeling in her usual health. She stated that she never had suffered from convulsions before. On Tuesday evening she went to bed feeling well. At 1.30 on Wednesday morning she got out of bed, appearing stupid and not to know what she was about. Immediately on lying down again she was seized with a fit. When this went off, consciousness did not return before another seizure came on, twenty minutes after the first. When I was sent for, I happened unfortunately to be away at another confinement, and did not get the message till after four o'clock. The tenth fit was just passing off when I saw the patient. On examination, I found the os soft, and easily admitting the point of the finger. I separated the membranes as far as I could, and then ruptured them with a stocking-wire. There did not appear to be any uterine contractions. The question then came to be, should I bleed? The patient was a little woman, moderately well nourished, and with a very short neck. The breathing was hurried, the inspirations being short and quick, but without any approach to stertor, and the expirations more prolonged and noisy. In other respects she was perfectly quiet between the fits. All the muscles were flaccid, and the limbs motionless. Pulse 72, regular; the face rather pale; no flushing before the fits; no throbbing of the carotids; in short, nothing to indicate any unusual tension in the circulation. I therefore determined simply to attempt delivery as speedily as possible, and proceeded as I had done in the other two cases. I first dilated the os as far as the uterine inertia would permit. I drew off a small quantity of urine with the catheter, and it proved to be highly albuminous. Indeed,

the water in the tube appeared, on being heated, to become converted into a curd. Shortly after five o'clock I applied the forceps, made traction on the head, and continued to push back the os. This was pretty well dilated before any well-marked expulsive efforts were made on the part of the mother, and these efforts were only brought on when I made the initiative by moderate traction. The labour was completed at a quarter past six o'clock. The child, a fine healthy-looking girl, cried lustily as soon as it was born, and up to this time it has kept well. I now expected the severity of the fits to abate, but in this I was disappointed. They continued to recur every twenty minutes, and as strongly as before. When a seizure was about to come on the patient opened her eyes with an expression so placid that one could hardly help thinking she was about to become conscious. But this was only for a couple of seconds; immediately the head was turned to a side and thrown back; the eyes were rolled upwards towards a corner of the orbit and the mouth opened with a short cry, resembling a suppressed exclamation of dread; then the muscles of the face drew the features into ugly contortions; the arms were thrown out with rapid whirling and striking movements, as if passionately aiming blows at an imaginary antagonist; the body, too, wriggled with movement, and the legs were fairly lifted off the bed with a rapid pattering action. As the fit was going off, the limbs first became quiet, the arms fell with one or two spasmodic jerkings of the shoulders, and the working of the face—now livid from venous engorgement—disappeared with a few twitching movements. Abundant frothy mucous, occasionally tinged with blood, came from the mouth. Till another fit came on the most complete relaxation was present; neither head, hand, nor foot stirred, but lay in whatever position it was placed. The respiration continued hurried, but was never stertorous. Early in the morning her hair was cut off, and six leeches applied to the temple. A turpentine injection was also given, and acted freely. In the forenoon I tried the inhalation of chloroform. None of these means had any effect in moderating the fits; they continued regularly till midnight, by which time she must have had about seventy seizures. From 12 o'clock till 6 a. m., on Thursday she had one fit each hour. During the day she had only slight seizures on the right side, the arm being thrown up as far as it could be raised; pulse had become very quick and weak. She had a severe fit in the evening at 10.30, and others on Friday at 3 a. m. and 5.30 a. m. In the forenoon she kept very quiet, and was able to swallow a little spirits and water. I saw her at 11 a. m., and felt very sanguine she would rally. The respiration was tranquil; pulse 80; the kidneys were acting freely. An hour afterwards, however, the breathing suddenly stopped. The nurse thought she was about to become convulsed again, but no fit came on, and the breathing did not return. I may mention, that the mother of this patient also died from childbed convulsions.

Remarks.—In detailing these cases, I have no intention to enter on the general pathology and treatment of puerperal convulsions; my special object has been to illustrate the safety of early instrumental interference when such seizures occur in the early stage of labour. As this is a point in practice on which authorities still differ, any facts bearing on it are not likely to be considered superfluous. Since I gave notice to your secretary that I would give an account of these cases here, a paper on Puerperal Convulsions has been published by Professor Dyce, of Aberdeen, in which occur the following remarks on this subject:—He says, "But there is another and very important part in the treatment which remains to be considered. The patient is suffering from a disease dependent upon the state of the uterus; which state, it is believed, can only be got rid of by terminating the labour. What, then, are the principles that should guide us regarding delivery in these difficult cases? In short, will it be proper to interfere with the progress of gestation or parturition? As far as my own experience goes, I believe that generally interference is prejudicial, in whatever stage of the labour the convulsions may occur. Most assuredly during gestation, and before labour has commenced, it will be universally conceded, as admitting of no dispute, that until labour has commenced any interference on our part would be highly inju-

rious,—so that in convulsions during pregnancy we have, as Gooch says, 'nothing to do with the uterus, but solely to attend to the convulsions.' It will be also equally admitted, that in the first or early stage of labour, should convulsions come on, every attempt by the finger or other artificial means to dilate the os uteri ought to be avoided, as it will be found not only to bring on convulsions, but generally to increase them in violence. Denman assures us that he 'attempted gently during every pain to assist in the dilatation of the os, but he was soon convinced that the convulsions were not only brought on and continued, but increased in violence; he therefore desisted, and left the work of delivery to nature.' Thus, then, before labour comes on, and in the first stage of labour, I consider interference wholly inadmissible, and only tending to increase the danger." To these principles scarcely any practice could be more directly opposed than what I have detailed. I interfered in the first stage of labour, and that roughly, but I also think rightly. In the first place, the conviction on my mind is very strong, that if I had not so interfered, all the mothers I have spoken of would have died undelivered; and, in the second place, I submit that my interference did not at all aggravate the fits. All the cases had this characteristic in common, that the seizures came on at wonderfully regular intervals, and that for hours before the uterus was meddled with. In one case chloroform, and in another bleeding, did not affect the length of the interval. Then—and in connexion with the quotation I have just given—this is a point on which I must lay great stress,—in not one of the cases was either the frequency or severity of the fits in the least affected by the attempts to dilate the os with the finger, nor by the still more severe process of dragging the head against its inner surface, and at the same time pushing back its edges with some degree of force. The inference which such facts naturally suggest is, that the fear of aggravating the fits by interfering with the os is entirely visionary.

Another point in the treatment of puerperal convulsions, in regard to which difference in practice exists, and on which the above cases may provoke criticism, is blood-letting. I may possibly be asked, why this was not carried to a greater extent in their treatment. To this I have simply to answer, that none of the cases presented vascular or constitutional indications for the free use of the lancet. The first was a weakly, ill-nourished anæmic woman, who evidently had not a drop of blood to spare. The second case presented a very characteristic specimen of the lymphatic temperament—plump in appearance, but soft and spiritless. I bled her to a moderate extent without any effect on the seizures, and my conviction is that I would have lessened the chances of her recovery if I had bled her to the extent frequently recommended. The third case was that of a stouter woman, with a short neck; still there was no plethora, the circulation was quiet; there was certainly no determination of blood to the head; and the experience of the two previous cases had led me to put some faith in patient waiting.

There are a number of considerations which I think may be allowed to have weight with one before taking away from twenty to eighty ounces of blood in these cases. In the first place, it appears to me that the great danger to life lies in exhaustion; and my third case illustrates this in a marked manner. On the second day of her illness, I felt so hopeless in regard to her condition that I did not think of interfering, but I now regret very much that I did not make an effort to sustain her strength with nourishing enemata. From the marked improvement that took place on the third day, I feel convinced that a little more vitality, such as a moderate amount of nourishment might have imparted, would have enabled her constitution to tide over the danger. Certainly, if ever I have a case of the sort again, this is a point in practice I shall be inclined perseveringly to attend to.

Then, in regard to the pathology of epileptiform seizures, the opinion appears to be gaining ground, that during their continuance the brain is anæmic, and not congested; that the blood is watery, and not over-abounding in red corpuscles. If this view be correct, then bleeding can only exert a beneficial effect by diminishing the absolute amount of a supposed poison in the blood. But it is to be remembered that the most certain effect of blood-letting is to

increase the proportion of the watery elements in the circulation; and it may therefore be a question whether, in uræmic convulsions, the *relative proportion* of irritating material in the blood may not also be increased by large bleedings. In this view, the occurrence of a convulsion, *per se*, is no more a reason for taking away a large quantity of blood than is the occurrence of a paroxysm of delirium tremens.—*Edinburgh Medical Journal, October*, 1868, *p.* 315.

94.—ON TURNING WHEN THE LIQUOR AMNII HAS RUN OFF, THE UTERUS BEING CONTRACTED UPON THE CHILD.

By Dr. Robert Barnes.

[The following paper is intended to illustrate and advocate the principle of seizing the knee of the child opposite to the presenting shoulder, in turning under the circumstances mentioned in the heading.]

The first question to determine is *Which hand will you pass into the uterus?* The left hand should be preferred. In the majority of cases the child's back is directed forwards; to reach the legs, which lie on the abdomen, your hand must pass along the hollow of the sacrum, and this can hardly be done, the patient laying on her left side, with the right hand, without a most awkward and embarrassing twist of the arm. I need scarcely point out how violent and unnatural a proceeding it would be to pass up the right hand between the child's back and the mother's abdomen, to carry the hand quite round and over the child's body in order to seize the feet which lie towards the mother's spine, and then to drag them down over the child's back. If you attempted this you would probably get into difficulty. The child, perhaps, would not turn at all. To avoid this failure, the rule has been laid down to pass your hand along the inside or palmar aspect of the child's arm. This will guide you to the abdomen and the legs. Or the rule has been stated in this way:—Apply your hand to the child's hand, as if you were about to shake hands. If the hand presented to you be the right one, take it with your right, and *vice versa*.

Rules even more complicated are proposed, especially by Continental authors. Some go to the extent of determining the choice of hand in every case by the position of the child. The fallacy and uselessness of these rules are sufficiently evident from the disagreement among different teachers as to which hand to choose under the same positions. Rules, moreover, which postulate an exact knowledge of the child's position, are inapplicable in practice, because this diagnosis is often impossible until a hand has been passed into the uterus; and it is certainly not desirable to pass one hand in first to find out which you ought to use, at the risk of having to begin again and to pass in the other.

The better and simpler rule is this:—*In all dorso-anterior positions, lay the patient on her left side; pass your left hand into the uterus*—it will pass most easily along the curve of the sacrum and the child's abdomen; *your right hand is passed between the mother's thighs to support the uterus externally.*

In the case of *abdomino-anterior positions, lay the patient on her back, and you may introduce your right hand, using the left hand to support the uterus externally.* If the patient is supported in lithotomy position, you can thus manipulate without straining or twisting your arms or body. But it is equally easy to use the left hand internally if the patient is on her back, so that the exception is only indicated to suit those who have more skill and confidence with the right hand.

We will first take a dorso-anterior position. Introduce your left hand into the vagina, along the inside of the child's arm. The passage of the brim, filled with the child's shoulder, is often difficult. Proceed gently, stopping when the pains come on. At the same time support the uterus externally with your right hand. Sometimes you may facilitate the passage of the brim by applying the palm of the right hand in the groin, so as to get below the

head and to push it up. This will lift the shoulder a little out of the brim. Or you may practise a manœuvre attributed to Von Deutsch, but which had been practicsd by Levret. This consists in seizing the presenting shoulder or side of the chest by the inside hand, lifting it up and forwards, so as to make the body roll over a little on its long axis. This may be aided by pressure in the opposite direction by the outside hand on the fundus uteri, getting help from the bi-polar principle.

Sometimes advantage is to be gained by placing the patient on her elbows and knees. In this position you are favoured by gravity, for the weight of the fœtus and uterus tends to draw the impacted shoulder out of the brim.

The brim being cleared, your hand passes onwards into the cavity of the uterus. This often excites spasmodic contraction, which cramps the hand, and impedes its working. Spread the hand out flat, and let it rest until the contraction is subdued. In your progress you must pass the umbilicus, or a loop of umbilical cord will fall in your way. Take the opportunity of feeling it to ascertain if it pulsates. You thus acquire knowledge as to the child's life. But you must not despair of delivering a live child because the cord does not pulsate. I have several times had the satisfaction of seeing a live child born where I could feel no pulsation in utero. You are now near the arm and hand. They are very apt to perplex. Keep, therefore, well in your mind's eye the differences between knee and elbow, hand and foot, so that you may interpret corectly the sensations transmitted by your fingers from the parts you are touching.

At the umbilicus you are close to the knees. The feet are some way off at the fundus of the uterus applied to the child's breech.

What part of the child will you seize? It is still not uncommon to teach that the feet should be grasped. You will see pictures copied from one textbook to another, representing this very unscientific proceeding. There ought to be some good reason for going past the knees to the feet, which are further off and more difficult to get at. Now, I know of no reasons but bad ones for taking this additional trouble. You can turn the child much more easily and completely by seizing one knee. Dr. Radford insists upon seizing one foot only for the following reason:—The child's life is more frequently preserved where the breech presents than where the feet come down first. A half-breech is also safer than cases where both feet come down. The dilatation of the cervix is better done by the half-breech. The circumference of the breech, as in breech presentations, is from twelve to thirteen and a half inches, nearly the same as that of the head; the circumference of the half-breech, one leg being down, is eleven to twelve and a half inches, whilst the circumference of the hips, both legs being down, is only ten to eleven and a half inches.

But a knee is even better than a foot. You determine, then, to seize *one* knee; which will you choose? The proper one is that which is furthest. The reasons are admirably expressed by Professor Simpson. We have a dorso-anterior position—the right arm and shoulder are downmost—these parts have to be lifted up out of the brim. How can this be best done? Clearly by pulling down the *opposite* knee, which, representing the opposite pole, cannot be moved without directly acting upon the presenting shoulder. If the opposite knee be drawn down, and supposing the child to be alive or so recently dead that the resiliency of its spine is intact, the shoulder must rise, and version will be complete, or nearly so. But if both feet are seized, or only the foot of the same side as the presenting arm, version can hardly be complete, and will, perhaps, fail altogether.—*Medical Times and Gazette, June* 20, 1868, *p.* 655.

95.—USE OF BARNES'S DILATORS IN INDUCTION OF PREMATURE LABOUR.

By Robert S. Cross, Esq., Petersfield.

[The patient in her two previous labours had been delivered by turning with great difficulty, owing to projection of the promontory of the sacrum. Mr.

Cross advised on the present occasion that premature labour should be induced. This was endeavoured to be effected by the free administration of ergot of rye. After this had been given some time and no pains induced,]

On examination, I found the vagina cool and moist, the cervix uteri obliterated, and the os low down and well within reach, open to the extent of readily admitting the first joint of the index finger of the left hand, with which I made a little dilating movement for a few minutes, and then introduced the smallest size Barnes's dilator; it glided in off my finger, without any trouble whatever. This was filled, and left in for about an hour and a half, at the end of which time the next size was introduced as readily. This was gradually filled, according to the sense of distension expressed by the patient, and observed by the finger round the margin of the os. I allowed this to remain in about an hour, towards the end of which time, pains, not over strong, but regular and of a somewhat expulsive character, began. On removal and examination, the membranes were found presenting (tense during pain), and the os about the size of the top of an egg-cup. Hoping that the uterine action (for which there had been great inapitude all along) would now go on vigorously, and wishing for the child's sake, to keep the membranes intact to the latest moment, I waited. The action, however, quickly subsided; and I then introduced No. 3, the largest-sized dilator. This was gradually filled, and allowed to remain about half an hour. The patient complained a good deal of distension. There were no pains; in fact, there seemed just that suspension of the process of labour often observed under natural conditions. I ordered nourishment to be given at intervals, and that I should be sent for in case of pains setting in. This was at 8 a. m. on the 14th. Her condition remained the same throughout the day; when, after a few pains, she was delivered of a fine child at 7.45 p. m., not living. She made a quick recovery, without hindrance, being down stairs at the week's end.

The case appears to me to offer points of some practical value as to the mode of producing premature labour by the mixed plan of ergot and Barnes's dilators. I had not much experience of these, or should, I think, in the present case, have ruptured the membranes immediately on the withdrawal of dilator No. 2. No. 3 seemed to paralyse the uterus for a time by over distension.

With regard to the best mode of bringing on labour, that does not appear to me to be necessarily the best which is the quickest. That mode most recommends itself to me by which the uterus, with its contents, can be best brought into a condition simulating natural labour before local interference is resorted to, in order that, when this is done, it may not only be more facile, but quicker as to results at a period when time, to the life of the offspring more especially, is of the greatest importance. Then, as to freedom from danger, there are well-authenticated cases of death from the douche plan; and the introduction of a catheter or foreign body into the cavity of the uterus, without any preliminary, does not commend itself on the score of inducing action in that organ in anything like a natural manner. The relaxing effect of the warm bath, the sympathetic irritation induced by purgative action and abdominal friction, followed in due course by secale, pushed more or less, according to individual proclivity to its specific action, undoubtedly bring about that descent of the abdominal tumour, that shortened neck and patulous os, together with the moistened and ready state of parts so beautifully arranged by nature as the first stage of natural labour. Arrived at this point, it appears to me that, by the aid of Barnes' dilators, we have it in our power to complete the labour quickly and safely for both mother and child; and, as the talented inventor could no doubt corroborate, it makes a good deal of difference in the facility of using these, whether the os is so high up as only just to be felt with the extreme end of the finger, or so low down as to be well within reach.—*British Medical Journal*, *Aug.* 1, 1868, *p.* 105.

96.—ON TURNING IN CONTRACTED PELVIS.

By Dr. Robert Barnes, Obstetric Physician to St. Thomas's Hospital.

The value of turning in moderate degrees of pelvic contraction rests greatly upon the truth of the following propositions:—*The head will come through the pelvis more easily if drawn through base first than if by the crown first.* Baudelocque affirmed this proposition ("L'Art des Accouchements"). He said—"The structure of the head is such that it collapses more easily in its width, and enters more easily when the child comes by the feet, if it be well directed, than when it presents head first." Osiander had maintained the same opinion. Hohl (1845) also pointed out that the bones overlapped more readily at the sutures when the base entered first. Simpson (1847) insisted strongly upon the truth of this proposition, and illustrated the mechanism of head-last labours with much ingenuity. The proposition has, however, been disputed, and that by Dr. M'Clintock (*Obstetr. Transact.*, vol. iv., 1863). He says—"I do not believe that the diameters of the head are more advantageously placed with regard to those of the pelvis, nor can I believe that the head is more compressible when entering the strait with its base than when it does so with its vertex, till this be demonstrated by direct experiment."

It is also contested by Professor E. Martin, of Berlin (*Monatsschr. f. Geburtsk*, 1867). He especially insists that when the vertex presents moulding may go on safely for hours; but that if the base comes first the moulding must be effected within five minutes to save the child.

I venture to submit that I have made such clinical observations as are equivalent to direct experiments. In the first place, let me state a fact which I have often seen. A woman with a slightly contracted pelvis, in labour with a normal child presenting by the head, is delivered after a tedious time spontaneously or by the help of forceps; the head has undergone an extreme amount of moulding, so as to be even seriously distorted. The same woman in labour again is delivered breech first; the head exhibits the model globular shape, having slipped through the brim without appreciable obstruction. For examples see my outlines of heads (*Obstet. Trans.*, 1866).

In the second place, I have on several occasions been called to an obstructed labour in which the head was resting on a brim contracted in the conjugate diameter. Of course, nature had failed; the *vis a tergo* was insufficient. I have tried the long double-curved forceps, trying what a moderate compressive power aided by considerable and sustained traction would do to bring the head through, and have failed. I have then turned, and the head coming base first has been delivered *easily*. Upon this point I cannot be mistaken. And I think this greater facility can be explained. Dr. Simpson has illustrated by diagrams how the head, caught in the conjugate at a point below its bi-parietal diameter, is compressed transversely as traction-force is applied below, causing the mobile parietals to collapse and overlap at the sagittal suture. And surely no one can doubt that the traction-power, and therefore the compressing-power, acquired by pulling on the legs and trunk is infinitely greater than can be exerted by the strongest forceps. But there is another circumstance in the clinical history of head-last labours in narrow conjugate which affords a remarkable illustration of this proposition. *The head is rarely, or never, seized in its widest transverse diameter; it is seized by the conjugate at a point anterior to its greatest width—that is, in the bi-temporal diameter;* the bi-parietal and occiput commonly finding ample opportunity for moulding in the freer space left in the side of the pelvis behind the promontory. The head, in fact, fits or moulds into the kidney-shaped brim wherever there is most room. I have given illustrations of this point also in the memoir referred to (*Obstet. Trans.* 1866). I think, therefore, it may be taken as demonstrated that the head coming base first passes the contracted brim more easily than coming crown first. And if the head comes through more easily, it may be inferred that the child will have a better prospect of being born alive.

Can we define with any precision the conditions as to degree of pelvic contraction that are compatible with the birth of a living child? The question is not easy to answer; nor is it important to be able to answer it very precisely. The great fact upon which the justification of the operation rests is this: many children have been delivered by it alive, with safety to the mother. We know accurately only one element of the problem—namely, the degree of contraction of the pelvis. The other element, the relative size and hardness of the fœtal skull, we can but estimate. *We must assume, in many cases, a standard head.* With this assumption the practical question is reduced to this: *What is the extreme limit of pelvic contraction justifying the attempt to deliver by turning?* In other words this means: What is the narrowest pelvis that admits of the passage of a normal head? This is answered chiefly by experience. It is not to be answered by *a priori* reasoning like that urged by Dr. Fleetwood Churchill, who says, even in his last edition ("Theory and Practice of Midwifery, 1866,"):—"The bi-mastoid diameter in the six cases measured (by Dr. Simpson) varied from $2\frac{6}{8}$ to $3\frac{2}{8}$ inches, and a living child can pass through a pelvis of $3\frac{2}{8}$ inches antero-posterior diameter, with or without the forceps. With a pelvis of this size, then, the operation is unnecessary; and if the antero-posterior diameter be less than $2\frac{6}{8}$ inches, the operation would be impracticable. These, then, are the limits of the operation; for us to attempt to drag a child through a smaller space would be unjustifiable."

To this statement of the case serious objections may be taken. The proposition that a living child can pass through a pelvis with an antero-posterior diameter measuring 3.25″, with or without the forceps, can only be accepted with considerable qualifications. I claim to speak with the confidence drawn from large experience when I say that a head of standard proportions and firmness will hardly ever pass a conjugate reduced to 3·25″ without the forceps, and very rarely indeed with the forceps—that is, alive. I might even extend the conjugate to 3·50″, and affirm the same thing. The compressive power of the forceps, unless very long sustained, is not great, rarely great enough to reduce a bi-parietal diameter of 4·00″ to 3·50″ without killing the child. My opinion, then, is that a standard head, especially if it happen to be a female head which is more compressible than a male one, *may be* drawn through a conjugate of 3″, but not with much prospect of life; and that the proper range of the operation of turning is from 3·25″ to 3·75″, at the latter point coming into competition with the forceps. I believe no one advocates resort to turning when the conjugate measures less than 3″.

A correlative proposition to the foregoing is the following:—*Compression of the head in its transverse diameter is much less injurious to the child than compression in its long diameter.* The truth of this is attested or admitted by most authors who have considered the point. It is insisted upon by Radford, Ramsbotham, and Simpson. It is confirmed by the observation of the form which the head assumes under moulding in natural labour, which, as I have shown, is effected by the lengthening of the fronto-occipital diameter, and the shortening of the transverse diameter. (Obstet. Trans., vol. vii. 1866, and Medical Times and Gazette, vol. ii. 1867.)

Now, it is an almost necessary consequence that when the head arrested on a contracted brim is seized by the forceps, it is seized by its fronto-occipital diameter, and to the longitudinal compression is added the increased obstruction to the entry of the head into the narrowed conjugate caused by the lateral bulging.

We will now discuss the question—What is the penalty incurred, or how can we retrieve our error, if we turn and fail to bring the head through the too contracted brim? Undoubtedly, the patient will have to go through a second operation. We are driven to perforate after all. We have tried to save the child, and have failed. Is the mother imperilled by this attempt and failure? This also must be answered by experience. Of course, the mother may suffer if we persevere in dragging the child too long and too forcibly. But we have a right to assume that the attempt is controlled by skill and discretion. The amount of force that can be safely endured is

very great—far greater than those who have never seen the operation would readily credit. The violence to which the soft structures are subjected seems to be small in proportion to the traction-force exerted. There appears to be some saving or protective condition. This, I think, is found in the mechanism of the process. I refer to Lecture V. (Medical Times and Gazette, November, 1867) for an illustration and description of the mechanism of labour in contraction of the pelvis from projection of the promontory. This projecting promontory forms the centre of rotation around which the head must rotate in order to enter the pelvic cavity. The side of the head applied to this point scarcely moves at all. The promontory catches the fœtal skull in the fronto-temporal region. If the coarotation be decided, the skull where it is caught bends in. All the onward movement is effected by the opposite or pubic side of the skull sweeping in a circle, which I have called "the curve of the false promontory," until the equator or greatest circumference has passed the plane of the brim, when the whole head slips into the cavity with a jerk. Now, injurious pressure is avoided on the pubic side by the smoothness and flatness of the inner surface of the pelvic brim, and by a gliding movement of the soft parts intervening between the head and the bony canal. Injurious pressure is avoided over the promontory by the yielding or moulding of the head. The temporal and parietal bones will bend in, even break. Children have been born alive after this bending or breaking. Sometimes a large cephalhæmatoma forms at the point of depression. In other cases the child perishes. The observation of these cases shows that the mother will bear with safety an amount of pressure which was sufficient to kill the child.

What follows? This obvious corollary—that the mother will safely bear that lesser degree of pressure which is required to bring through a living child.

The operation, then, is justified in cases of contraction that admit of the passage of a living child. It is further justified in cases of contraction to a certain, though small, degree of contraction beyond this, which admits of the passage of a dead child. We have here, perhaps, carried the experiment to the verge of what is justifiable. Beyond this, there being no possibility of getting a child, live or dead, through the pelvis, it would of course be better not to go. And if all the conditions of the problem could be precisely ascertained beforehand, we should not go beyond this. But whilst calculating upon an average or standard head, we may encounter a head above the standard in size or hardness, and thus, in our endeavour to save the child, we may find ourselves in a difficulty. The extrication is by perforation. By lessening the head, it is brought within the capacity of the pelvis. This is, indeed, an acknowledgment of defeat; it is beating a retreat. The justification, however, is that we accomplish in the end exactly that which those who reject the operation accomplish—namely, the safety of the mother. We have tried to do more—to save the child as well.

Is there any great difficulty or danger in perforating after turning? I believe not. The child's body is drawn well over to one side by an assistant, so as to facilitate the access of the operator's guiding fingers and the perforator to the child. The best place to perforate is in the occiput; but if that part be not easily struck, the perforator may be run up through the base of the skull. An opening into the cranium being made, the crotchet is passed into it, and the discharge of brain facilitated. Then, resuming traction on the trunk cautiously, the skull will probably collapse enough to pass easily. If not, the craniotomy forceps can be applied; or, better still, the cephalotribe, to crush up the base of the skull. Now, under the postulates of the case, this late recourse to craniotomy must not be considered as a severe or hazardous addition to the risks of the woman. The turning has been performed early in labour—that is, before the liquor amnii has all drained away, whilst the child is still freely movable, and before there is any serious exhaustion of the mother. Under these circumstances the turning, especially if conducted, as it commonly may be, on the bi-polar principle, is not necessarily a long or a severe operation. If we fail in extraction, which is soon

ascertained by observing that the head makes no advance, but that its globe expands broadly above the brim of the pelvis, perforation can be performed in good time. In short, the safety of the mother is secured by carrying through both operations whilst her strength is good. If exhaustion had set in, we should not have turned at all, but have proceeded to craniotomy in the first instance. To these considerations must be added the result of experience, which is to the effect that the retrieval by the secondary operation of craniotomy is successful.

What is the chance of saving the child? Dr. Churchill urges that "the life of the child is not secured, and its chance but little increased, even if our estimate of the pelvic diameters be accurate; for, if in turning with an ordinary-sized pelvis rather more than one-third of the children are lost, the mortality will be surely much increased if its diameter be reduced more than one-fourth." I will not stop now to press the preliminary objection I entertain to submit the decision of this or any other question in obstetric practice to *à priori* arguments drawn from statistics. It would not be difficult to prove that the statistics employed by Dr. Churchill are a confused heap of incongruous facts, and that rules to guide practice drawn from them must be stultified by endless fallacies. It is enough to state that the operation is not recommended by any one when the pelvis is contracted more than one-fourth—that is, below three inches—therefore the argument, statistical or other, is beside the question. I am not able to state or to estimate the proportion of children saved or lost under the operation. It is enough to justify the operation if we save a child now and then. I believe, however, that, exercising reasonable care in selection of cases and skill in execution, more than one-half of the children may be saved. And to save even one child out of twenty is something to set against the deliberate sacrifice of all.

Not assenting to the proposition that one child out of every three is lost by turning where there is no disproportion, I do not doubt that a much larger proportion would be lost under turning where the conjugate diameter of the pelvis is less than 3″. But, as I have said, the comparison is gratuitous, for no one, I believe, recommends turning in this latter case unless the child be premature. Experience here again corrects the foregone conclusion deduced from statistical reasoning. The risk to the child is considerably less than might be fairly anticipated. It is a matter of observation that *in cases of moderate contraction the funis is safer from compression than in cases of normal pelvis.* I have found the cord commonly fall into the side of the pelvis towards which the face looks, and there it is protected in the recess formed by the side of the jutting promontory; so that if the soft parts are sufficiently dilated not to compress the cord against the child's face, and if the labour can be completed under 5″, or even a little more, the child has a very good chance indeed. This proposition is especially true in the case of premature labour with contracted pelvis. In this case the child may, in the great majority of cases, be saved by turning. I have in this way saved many children who still survive to parents who would otherwise be childless. It deserves, I think, to be laid down as a rule in practice that *where the conjugate diameter measures from 2·75″ to 3″, delivery by turning should be the complement to the induction of labour at seven or eight months*—at least, I have acted on this rule with the happiest results.

Since the design of the proceeding is to save the child, it is obviously useless if the child is dead. How do we know when a child is dead? It is by no means easy to acquire certain knowledge of this fact. Nothing is more common than to read in clinical records "that the pulsations of the fœtal heart being no longer audible with the stethoscope," or, "the pulsation in the cord having ceased," or, "meconium having escaped," the death of the child was assumed, and the perforator was used without hesitation. I will not dispute that these are presumptive evidences of death, but I have too often experienced the satisfaction of seeing a child resuscitated after I had ceased to feel the pulsation in the cord, and after the free escape of meconium, to abandon the hope of saving the child without more certain evidence. This is found in great mobility and crackling of the cranial bones; the caput

succedaneum falling into loose skin-folds; the coming away of epidermis and hairs.

So long as there is tonicity, rigidity, or firmness of the limbs, life is present; but flaccidity is not a certain sign of death. A sign of threatening imminent death is a twitching or convulsive movement of the leg held in your hand. This indicates an attempt at inspiration made to supplant the suspended placental circulation. When this is felt, it is a warning to accelerate delivery, and to excite a rial respiration.—*Medical Times and Gazette, Sept.* 5, 1868, *p.* 259.

97.—DESCRIPTION OF A WHALEBONE FILLET FOR FACILITATING LABOUR.

By Robert K. Debenham, Esq.

Many cases of lingering labour are left to the unassisted efforts of nature, when instrumental assistance would not only spare much suffering, but tend to the safety of the patient. The use of forceps in these cases, in private practice, usually brings discredit upon the practitioner; either he is said to lack patience, or to be clumsy, or "such assistance was never wanted on former occasions," and wise women, whose opinions have a mighty influence in the lying-in room, probably give their *fiat* against such interference. Sending home for instruments is often a difficulty, and is sure to frighten the whole household, therefore many accoucheurs, especially if in country districts, carry a fillet or vectis in the pocket. Some objections are made to both of these instruments; yet something of the kind seems necessary. I had made for me, a year or two ago, by Ferguson of Giltspur-street, an instrument which, I think, has advantages over either. It is not formidable in appearance, is soft and pliant, and can be carried readily in the pocket. Its application is easy and painless, and there is no occasion to alarm the patient by bringing her to the bed's edge, or by any change of posture. Being thinner than forceps-blades, it occupies less space between the vagina and head, and by reason of its elasticity, it adapts itself better. Over the fillet it has the advantage of being introduced without force or scraping of the soft parts, yet it covers a far more extensive surface for the application of traction. The instrument consists of two long loops of whalebone interlaced, the free ends terminating in handles similar to forceps, but shorter, a peg being attached to lock them when required. The length of the loop is ten inches by three-quarters of an inch in width. In appearance it is a long straight forceps, with the blades interlaced. In adaptation it is like the fillet, being passed over the chin or occiput.

To apply it, the blades are passed together side by side beneath the head, like the lower blade of a forceps. Fixing the anterior handle with the left hand, the posterior is held in the right palm by the thumb and last two fingers; the other two fingers, being passed as high into the vagina as possible, are used to bend the blade almost to a semicircle to the hollow of the sacrum, then, by a turn of the wrist upwards, the blade is swept forwards around the upper surface of the head, rotating upon its extremity, and is brought into position opposite its fellow. The handles are now locked with a peg, and if kept well towards the perineum, there is no fear of slipping. I have used it in the ordinary position, and also over the occiput in a face presentation. It has the advantage of leaving no marks upon the child. I hope it may be the means of preventing many hours of suffering, in cases where there may be objections to the use of a more formidable-looking instrument.—*Clinical Lectures and Reports of the London Hospital*, 1867–8, *p.* 506.

98.—A CASE OF PARTIAL PLACENTA PRÆVIA.

By Dr. Robert Fowler, District Medical Officer of the East London Union.

[The patient was at her full time of the sixth child. She had been flooding

severely before Dr. Fowler's arrival.' He found her in a state of collapse—pale. cold, and almost pulseless.]

The presentation was so high that I could not make it out, until I had the whole hand in the vagina. The os was dilated to the size of the mouth of a wine-glass. *It was impossible without great and excessive violence to have got my hand through the os.* I plainly felt the edge of the placenta reaching to the level of the posterior lip of the os, and the posterior portion of the cervix was clearly thickened by the attachment of the spongy mass. In front of this latter I detected the fœtal head *covered with the membranes. There was not the least uterine pain.* Finding it impracticable to introduce my hand, I passed two fingers through the os, and *completely detached the placenta, as high as my fingers could reach, from its cervical attachment. Immediately I had effected this all hemorrhage ceased.* I then gave one scruple of powder of ergot in brandy-and-water, and covered the poor shivering thing with what wretched means were at hand. There being no food in the house save bread and tea, I had some of the latter made, and in about half an hour's time gave her therein another dose of the ergot. No pain followed. The woman had, however, wonderfully rallied, had become warm, talkative, and acquired a fair pulse. Although the membranes somewhat protruded through the os, I now determined, as there seemed no necessity to hasten or force labour, to *watch and see what nature could or would do.* As a matter of precaution, previously plugging the vagina, I left her in charge of the midwife, who had soon also to leave, being sent for to another case. I saw the patient again at five a. m. *There had been no hemorrhage and no pain.* She was doing well. To continue her brandy, tea, and sopped bread. At nine a. m. she obtained the necessary medical comforts. At two p. m. matters were still the same. As she complained of inability to make water, I removed the plug, *which was scarcely stained with sanguineous discharge.* She received four visits from the midwife during the day. At eleven p. m. I found her complaining of pain in the lower belly. This evidently depended on distended bladder, and was at once relieved by catheterism. The os was now more dilated and softer, and the head was just entering the brim. There were still no pains. In an hour after my visit to the patient pains came on, which the widwife on her arrival found well established. *Nature had ruptured the membranes*, the head was in the cavity, and completely through the os. *A still-born male child was naturally expelled, without the least return of hemorrhage* either before or after its birth, at between two and three a. m. of the 10th. *The bones of the child's head were separated, the whole body was discoloured, and the cuticle desquamating.* Unfortunately no notice was taken of the appearance of the placenta. The woman did perfectly well.—*Lancet, Aug.* 1, 1868, *p.* 145.

99.—ON HYSTERIA.

By D. De Berdt Hovell, Esq., Five Houses, Clapton.

[If any nervous symptom be owing to reflected irritation from the uterus it is properly named hysterical; any such symptom not originating in this way is misnamed hysterical.]

In a large number of cases the term hysterical is a misnomer. It would be better to describe as neurosis of the stomach a condition of that organ which is essentially atonic, but not necessarily complicated with a special relation to the uterus.

Long-continued observation in this class of cases has led me to the conclusion that not only the so-called hysterical vomiting, but hysteria itself, all the phenomena of the disease, and all the symptoms included in the hysterical category, do not originate with the uterus, but are caused simply by some source of irritation supervening upon a condition of *depressed nerve power from emotional causes:* that it is a nervous disease of general and not special origin. It may exist in conjunction with uterine irritation, or quite independently of such cause. The hystera, or uterus, is not necessary to its

returned. The camphor water was continued, but it had now lost all efficacy.

And yet, in spite of the retention of so little food, this young woman does not look ill; making allowance for her fair complexion, I do not think she looks even delicate, or that she would strike one as having anything the matter with her. She is not by any means emaciated; and it is quite certain that, in spite of appearances and her own impressions, she must retain a good deal of what she swallows. She has certainly gained flesh since she has been in the hospital, and has more colour.

[Dr. Salter passes on to consider the various causes of vomiting which must pass under mental review in forming a diagnosis of such a case as the one under consideration.]

In determining whether any symptom is hysterical, we are often guided by the existence or not of other signs of hysteria—by signs which tell us whether the individual is one in whom hysterical symptoms are likely to occur. These presumptive circumstances in favour of hysteria are in this case very strong. In the first place, we have evidence of hysterical tendency. The girl was nervous and excitable as a child, and subject to hysterical paroxysms both in childhood and recently. Her manner and aspect are characteristically what are called hysterical: she speaks to you with averted eyes, and never looks you full in the face; she is nervous, fidgety, twitching, and restless; she has a "hang-dog," sullen, glum expression, and an "injured" manner. Then she has those two characteristic symptoms of hysteria, the passage of what is called hysterical water, and the lump in the throat. The topography also of most of her symptoms, except the vomiting, is such as we see in hysteria; they are almost all of them pelvic—the pain in the lower part of the back, in the genitals, legs, and groin, and the painful micturition. It is extremely common for morbid sensations having an hysterical origin to group themselves in the neighbourhood of the generative organs; and in any case of supposed hysteria such a localisation would, to my mind, be a strong presumption in favour of such a diagnosis.

Then, again, the aggravation of the symptoms at each monthly period points to the same conclusion. The headache is then worse, the paroxysms of pain in the genitals are then almost constant, the irritability of the bladder is greater, and pain is then felt, and only then, on passing her motions. The sudden aggravation of the symptoms at the establishment of the reproductive function is, in relation to diagnosis, a congruous circumstance: she never vomited her supper till she menstruated; then the vomiting became constant instead of occasional, then the headaches commenced, and then the other pains in sacrum, genitals, legs, &c, became suddenly worse.

But we have, besides all this presumptive evidence, specific and positive proof of the vomiting itself being hysterical. In the first place, it was evidently nervous vomiting—that is, it was under nervous influence, for if a stranger was present it could not take place; then, again, it was worse at each monthly period, and, if stopped, always recurred at that time; then, again, as I have already mentioned, it became more marked and constant when menstruation was first established. It had besides evidently a vicarious relation with her other hysterical symptoms; when she does not vomit, the pain in the genitals is worse, and the lump in the throat;—that is, if the hysterical state does not manifest itself in one way it does in another. Lastly, the character of the vomiting itself is such as we see in nervous vomiting, and therefore such as is compatible with an hysterical interpretation of it; and not such as we see in primary stomach vomiting: there is no nausea, no warning of any kind, she never felt and never feels *sick*—the stomach simply empties itself.

Whether the loss of power in the left arm, recurring every morning for so long a time, was a form of hysterical paralysis, or whether it was that peculiar form of loss of power in the hand and arm in the morning which I have seen in many females, and which I believe to be rheumatic, I will not say, and therefore I will not give it any weight as a symptom.

It may be objected that the vomiting could not be hysterical because it

occurred habitually before the functions of the uterus were established—back into her early childhood, as long as she can remember, the girl says that she was troubled with this symptom. But this objection I think amounts to little more than a proof that the word *hysteria* is a bad word for that which we mean to designate by it. It is quite certain that children may show all the symptoms of what we call hysteria long before menstruation commences; and when I call this case a case of hysterical vomiting, I mean that the vomiting is a symptom of that morbid irritability that we so often see in females, that depends on the impressibility and mobility of their nervous organisation, and is oftener set wrong by derangement of the sexual functions than by any other cause. Hysteria depends on type of nervous organisation, and not on the possession, or the disturbed function, of a uterus.

A word about the thirst. The girl says she was always thirsty, and is so still. Has this symptom any independent meaning of value? I think none at all. I think it simply points to the vomiting, and simply depends upon it. The thirst of vomiting is something of the same nature as the thirst of hemorrhage, except that in the one case the thirst depends on a demand for water to make up for the circulating fluid that has been lost, and in the other on the fact that the vomiting prevents the water constantly demanded by the blood from ever reaching it in sufficient quantity. The state of a person who always vomits fluid the moment it is swallowed is very much that of a person who never drinks. Wherever there is constant and immediate vomiting there is thirst.

I may here mention a case that occurred to me not long ago in private practice, presenting many points of resemblance to the one I have been commenting on, and evidently belonging to the same class.

C. B., aged 17, a young lady living in Essex, called on me the 4th of last October. She was then rather thin, although she had formerly been stout. She stated that she was regular, and was quite well up to the end of June, when she began to vomit. The vomiting then went off for about three weeks, then came on again, and has continued ever since. Of this vomiting she gave me the following account. It comes on quite suddenly, without any warning; but sometimes is preceded by "windy spasms," with eructation. She never vomits without having taken food. There is no pain or tenderness in the epigastrium, but there is pain in the right hypochondrium and in the chest; the pain in the right hypochondrium is worse when she is fatigued—that in the chest just after vomiting. There is no nausea, but the food suddenly comes up; without any distinct act of vomiting at all, it suddenly appears in the mouth. As she is sitting at her meals, before she has finished, she has to rise and run away; sometimes the food has not been swallowed a minute. It is always unchanged. Some things are never vomited, and the choice is most capricious. The things that have been best kept on the stomach are fruit (even nuts), oysters, bran biscuits (a sort of gingerbread nuts), toast, and tea. The things that are the most invariably returned are meat and milk; the milk is thrown up at once. Bread is now at once returned, especially for the last four days. Pastry was kept down for some time, but now that is returned. Vegetables are returned. Wine, brandy-and-water, and beer return immediately. She is always hungry; bowels disposed to be confined. She is very nervous and excitable, and three weeks ago had hysterical paroxysms, from which also she suffered when she was a child. The following additional facts were communicated to me by her medical attendant:—"The vomiting is worse towards the latter part of the day. Her sister states (in strict confidence) that what she steals (that is, takes on the sly) is more frequently retained than anything else. The substances the most easily retained are what one would call indigestible. I have witnessed one or two attacks of the vomiting. She would be sitting at table at her meal, get up, and go out of the room, and the food would be found almost unchanged. There would be but little retching; the food seemed to come up as easily as in an infant. As fruits, whether pulpy or oily, are the substances most easily retained, I have ordered her to eat freely of them." I was subsequently informed by the same gentleman that she was a young lady who habitually gave way to

the most violent and uncontrollable outbursts of emotion, so that the peace of her family was quite compromised by them.

The chief points which this case and that of Eliza T. have in common are —the evidence of nervous and excitable temperament, and of liability to hysterical paroxysms; the absence of all symptoms of dyspepsia or disease of the stomach; constant hunger; the ease and absence of effort with which the food rises into the mouth; that the vomiting comes on without any warning; that it is unaccompanied by nausea; that it never occurs except immediately on taking food; and that the tendency of food to cause vomiting is entirely independent of its digestibility.

I suppose you will hardly be contented if I dismiss you without saying something about the treatment of such cases as these. But, in truth, I have little to tell you, except this—that you will find them among the most unsatisfactory cases, in the way of treatment, of any that will come under your observation. There is, indeed, but little to be done for them. On one point you may make up your minds: it is of no use to treat the stomach. I believe in most of these cases there is nothing wrong with the stomach whatever. What you have to treat is a certain condition of the nervous system. *You must cure the hysteria.* Now you know how difficult a problem that is. As long as the hysteria remains, so long will its particular manifestation, whatever it may be, and whatever organ it may effect, remain also. In the case of Eliza T., we employed every remedy that we could think of to allay the irritability of the stomach, but without any but the most doubtful and evanescent effect. We gave her all kinds of sedatives—opium in various forms, hyoscyamus, belladonna, conium, hydrocyanic acid; we tried creosote, bismuth, oxalate of cerium; valerian, ammonia, ether, assafœtida; shower-bath iron, quinine—in fact, we exhausted all our resources, both in the treatment of the symptom and of the essential morbid state,—and all in vain. I do not mean to say that all treatment in such cases is necessarily inoperative, but that in order to be operative it must appeal to the state of the nervous system, and that it will only control the sickness in so far as it controls the hysteria. There is one event, however, which, if it could be brought to bear upon either of these cases, would, I believe, stop the sickness, and that is the induction of maternity. When the subjects of such symptoms marry, all vomiting ceases; or rather the particular kind of vomiting they have suffered from is exchanged for another and more temporary and tractable kind of sickness.—*Lancet, July* 4 *and* 11, 1868, *pp.* 1 *and* 37.

101.—A CASE OF VAGINAL ATRESIA AND ABSENCE OF MENSTRUATION CURED BY THE USE OF TANGLE-TENTS.

By Dr. W. Murray, Physician to the Newcastle-upon-Tyne Dispensary.

Miss A. B. C., a young lady, aged 27, slightly marked with the pits of small-pox, consulted me fifteen months ago. She complained of a severe pain in the hypogastric region, and radiating pains in the back, loins, and lower extremities. She had suffered in this way for some years, and she said her pains periodically increased at intervals of five or six weeks. On further investigation, it appeared she had menstruated only once or twice in her life, and that the show scarcely amounted to a teaspoonful on each occasion. On proceeding to examine the uterine organs, I was surprised to discover that the vagina was a mere *cul-de-sac*, an inch deep, terminating in a conical depression. The walls of the *cul-de-sac* were made up of cicatricial tissue; and at the fundus of the depression in which the *cul-de-sac* terminated, I detected a minute opening through which a No. 1 elastic bougie would scarcely pass. In order to make a further diagnosis of the case, I determined to introduce a tangle-tent into the minute orifice I had discovered, and then to pass the uterine sound through it. This was done; and on passing the sound, I introduced my finger into the rectum and felt the point of the instrument projecting through the solid barrier in the vagina into a cavity above. Beyond

this upper part of the vagina I could feel a round body very like the uterus in size and shape. As the dilatation had caused some pain, and as no immediate result followed it, the patient and her friends declined further interference at this time, and I did not see her again until August last. I then found her suffering as before, and very much altered in appearance; her countenance was haggard, her manner hysterical, and her nutrition impaired by constant vomiting. She was now prepared to go through any kind of treatment to obtain relief.

Having obtained the assistance of Mr. J. B. Fife, whose advice and surgical skill proved invaluable throughout the whole procedure, I dilated the small opening through the closed portion of the vagina, until it admitted the tip of the little finger. At this point an accident occurred, from the string attached to the tent having given way, leaving the tent firmly impacted in the newly formed canal, where it remained for about thirty hours, when Mr. Fife removed it by making a slight notch in the canal on each side of it. When the tent was removed, the finger could be freely passed through the opening it had formed into the upper part of the vagina, and there we found a somewhat contracted but perfectly formed cervix uteri. The dilatation was now continued freely by sponge-tents until a large speculum could be passed into the vagina. The uterine sound was then passed, and a very minute os uteri was discovered by it. The sound, when twisted a little to the right, could be introduced an inch deep into the cervix uteri. This enabled us to secure the introduction of a small softened tangle-tent in the direction indicated by the sound, by a little careful manipulation, the tent slipped almost overhead into the uterus. When this tent was withdrawn the next day, a very free passage into the uterus remained. Both the vagina and the uterus now showed an obstinate disposition to contract and assume their former condition, so that we were compelled to incise the cervix uteri freely with Greenhalgh's hysterotome, and to keep both the canal of the cervix and the vagina constantly dilated for some days.

Exactly one month from the time the hysterotome was used, the menstrual flow appeared and continued for three days. In every respect the period and flow were normal. From this time the patient improved rapidly in general health. At the end of another month, finding the os uteri slightly contracted, I introduced a tent for a few hours, and gave the patient two doses of aloes. After this, the menstruation again took place, but it was unfortunately stopped by a severe fright received by the young lady during the following night. From this time all went on well till another month elapsed; then she began to suffer pain, to vomit, and to assume a hysterical manner, but after waiting patiently for a few days, relief of all these symptoms was obtained by the reappearance of menstruation for the third time. On this occasion, it was full, free, painless, lasted five days, and left the patient quite well, without ache or pain. Six or eight menstrual periods have now occurred; for the most part they have been very satisfactory, and on each occasion they have been followed by great improvement of the patient's health.

The chief point of interest in this case is the entire abeyance of the menstrual functions of the uterus during a period of at least fourteen years from the age of puberty. The entire want of action previous to the dilatation of the parts was proved by the total absence of retained menstrual fluid. I might add, that it is quite clear the closure of the vagina was produced by the extension of small-pox into the vulva, and subsequent ulceration of the walls of the vagina. The case strongly commends the use of dilatation instead of cutting in cases of closure of mucous canals of all kinds; and where no opening exists to permit of this, I should introduce a fine trocar, and then leave a tangle-tent in its place as a commencement of the dilating process.—*British Medical Journal*, *July* 4, 1868, *p.* 5.

102.—A NEW UTERINE DOUCHE.

By Dr. Hermann Beigel, Physician to the Metropolitan Free Hospital.

The application of the syringe is so extensive in all branches of Medicine, Surgery, and natural philosophy, and the apparatus hitherto in use for that purpose so deficient, that, in hospital work, as well as in private practice and in scientific researches, I have very often felt the want of a good instrument. The hand-ball first constructed by Dr. Bergson, and afterwards improved by Dr. Andrew Clark, which I have found of great service in my researches on the inhalation of atomised fluid, and which has rendered available Dr. Richardson's excellent and very important invention of local anæsthesia, seemed to me the best instrument for the motor power required for a syringe.

In some departments in medicine, the success of the case depends very often on the instrument applied. In chronic metritis, for instance, and in other diseases of the female genito-urinary organs, all our efforts may be frustrated if we cannot place in the hands of our patient an instrument which may be easily handled and readily applied, refilled, cleaned, &c.

The uterine douches hitherto in use may thus be classified :—

1. Instruments acting by direct pressure on the liquid to be injected, as the common syringe. Ancient as this instrument is, and simple in its construction, yet, in spite of its simplicity, it possesses great disadvantages. Change of temperature and frequent use have great influence over the proper adjustment of the piston to the tube, which adjustment is indispensable for good action. The slightest looseness makes the fluid escape above the piston, and little or nothing is injected. Another inconvenience is the small size of these instruments, and the necessity of requiring a second person for some injections—enema, for instance. The simple syringe has been modified by C. Mayer and others, in order to remove some of the defects just mentioned; but these modifications are expensive, complicated, and are still more liable to get out of order than the common syringe.

2. Apparatus working by means of exhaustion. Some of these work well, but labour under the great inconvenience of not being able to produce a continuous jet, which is often very essential; besides, the means of increasing and diminishing the force of the jet is very limited.

3. Apparatus acting as siphons, as does Scanzoni's well-known uterine douche, consisting of an india-rubber tube and a metal weight, in order to keep the tube in the vessel containing the fluid to be injected. Here the jet is thrown out in a continuous stream, and its force may be varied by raising or lowering the vessels. This arrangement, simple as it is, labours under the disadvantage of requiring different heights for regulating its force; and even when properly adjusted, a slight traction upon the tube may easily upset the vessel and throw the fluid over the patient's head.

All defects of these apparatus have been, I think, avoided in the instrument represented in the following woodcut. Its mode of operation needs scarcely any explanation. A is the vessel containing the fluid to be injected; it is capable of holding about two pints, but may be made of any capacity required. B is the top, which can easily be adjusted to the bottle by a very simple arrangement at C. This top is on one side connected to the handball E, the action of which compresses the air above the fluid in the vessel; on the other side of the top projects the tube F, having a stopcock at G. A few movements of the handball suffice to compress the air sufficiently to cause the fluid to escape by the tube D as soon as the stopcock becomes opened. The regulation of the force of the jet, which is continuous, is easily effected by the handball. The apparatus, as manufactured by Messrs. Mayer and Meltzer, of Great Portland-street, is very portable, can be cleaned with the greatest ease, and works with the utmost perfection. It may as well be applied for uterine purposes as for the rectum, eyes, pharynx, nose, &c., as for cleansing wounds and other surgical requirements. A smaller form of the apparatus answers well for microscopic injections, and,

in fact, will be of great service whatever injection or syringing is required. —*Medical Times and Gazette, July* 11, 1868, *p.* 31.

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103.—ON THE LOCAL APPLICATION OF CARBOLIC ACID IN UTERINE DISEASE.

By Dr. Lloyd Roberts, Surgeon to St. Mary's Hospital for Women and Children, Manchester.

[The cases in which Dr. Roberts recommends the application of carbolic acid are precisely those in which nitrate of silver is of use. These are ulceration of the os and cervix uteri, with or without hypertrophy; chronic inflammation of the uterus, and cervix, with excoriation; cases of follicular disease of the cervical canal. Its mode of application is as follows:]

For its application in ulcerative disease, the only requisites are a speculum, uterine forceps, and lint. The surface of the ulcer, first wiped clean with lint, is then touched with another piece of lint saturated with the acid, previously liquefied by the addition of a little water (a few drops to 3 or 4 ox. of acid). The surface of the sore may be gently dried with another piece of lint, which will serve also to absorb any superfluous acid that may have drained into the speculum. Care should be taken not to touch the vaginal mucous membrane with the acid, as it not only excoriates but causes some pain for several hours For the introduction of the acid into the cervical canal I have used a camel's-hair pencil, or, when this could not be introduced, a gum elastic catheter or bougie dipped into the acid, the canal having been first cleansed by the injection of water, or by other means, such as the introduction of a pledget of lint, when the os uteri is sufficiently open for the purpose. In cases of ulceration occurring in child-bearing women it is singular to what an extent the cervical canal becomes patent. A No. 14 bougie can often be passed into it with ease. The application of the acid may be repeated once or twice a week, according to circumstances. In addition, I have commonly used a lotion composed of ʒj. to ʒij. of the acid, and ℥j. of glycerine to Oj. of water, which acts both as a healer and a disinfectant.

The advantages which carbolic acid appears to me to possess in cases of uterine disease are the following:—

As *a caustic* it is especially useful, occupying as it does in escharotic power a position intermediate between the milder nitrate of silver and the

more powerful corrosive caustics, potassa fusa, the mineral acids, acid nitrate of mercury, &c. More energetic than the first-named salt, it is at the same time free from the danger to the neighbouring structures which attends the use of the more potent caustics. Although its action does not penetrate below the diseased surface, it possesses in equal degree with the stronger caustics the property of changing the vitality of the tissues, and produces rapid cicatrization, dissipates the inflammation and hypertrophy, and relieves pain.

By its disinfectant action it destroys the offensive odour of purulent and other discharges, and acts beneficially upon the unhealthy, lax, and discharging vaginal mucous membrane.—*Practitioner*, *Oct.* 1868, *p.* 230.

104.—THE TREATMENT OF SO-CALLED "IRRITABLE UTERUS."

By Dr. Graily Hewitt, Professor of Midwifery and Diseases of Women, University College.

[Nothing is more painful than the condition of a patient with irritable uterus. On examination, the womb is found exquisitely tender; but it may be perfectly healthy otherwise, or it may be ulcerated, or congested generally or in one spot. The exalted sensibility is evidence of a general rather than a local disorder. The above is the generally received opinion of the nature of the disease, and is pre-eminently that of Gooch.]

Further experience, together with a careful consideration of the whole matter, has led me to a more firm, and indeed a very decided opinion on the subject, and now I avow my conviction that the "irritable uterus" is nothing more nor less than retroflexion of the uterus of a marked form, that the symptoms present in the cases described by Gooch were due to the flexion in question, and that the symptoms so dependent can be made to disappear, and the patient be restored to comparative—often to perfect—health, by remedying the defect, and by restoring the uterus to its proper shape.

The evidence I have to offer, that the symptoms supposed to be due to the "irritable" uterus arise from retroflexion of the organ, is of the following kind. I have had several, I may say as many as fifty cases, under my notice at various times, in which these symptoms in various degrees of intensity have been present; the descriptions given by Gooch of some of the cases might have stood for descriptions of the cases observed by myself, but in all of my cases I have detected retroflexion of the uterus, the organ having the form of a retort, in various degrees. On the other hand, having now had a very considerable experience of uterine disease, I can say with confidence that I do not recollect to have met with a single instance presenting typical irritable uterus symptoms *un*accompanied by the kind of alteration now alluded to. I have met with cases, it is true, where the uterus was tender to the touch, and also cases where, in addition to this, locomotion was painful, but never in the degree so graphically described by Dr. Gooch. I know not how more conclusively to prove the truth of the ideas which I have on the matter, than by the foregoing argument.

Why, it may be asked, does retroflexion of the uterus give rise to such excessive irritability of the organ? The answer to this will be, I conceive, as follows:—The flexion produces, mechanically, engorgement of the uterus, interferes with the circulation within it, and compresses the nerves which course through its tissues. And the stretching and dragging of the peritoneum involved cannot be unimportant. It generally happens in these cases that a cursory digital examination gives an incorrect idea as to the locality of the tenderness, for when the examination is done gently it will, as a rule, be found that the cervix is hardly, if at all, sensitive, while the slightest touch on the fundus of the uterus, which is now low down and displaced, and can be felt behind the vagina, gives the acutest pain to the patient, thus showing that the sensitiveness is localized. A rough push of the finger against the *os* gives pain because the whole uterus thereby undergoes concussion.

The importance of the flexion in those cases of irritable uterus where its *existence* has been actually recognised, has been greatly underrated, in consequence, as I believe, of the doctrine and teaching of Gooch. And as the observations and remarks of Dr. Ferguson have only tended to confirm Dr. Gooch's view of the matter, it is not surprising to find, that even at the present day there is an indisposition to believe in the existence of a structural change of the organ in case of irritable uterus.

I am far from denying the importance of structural uterine lesions. But I hold that in a very large number of cases these structural changes are themselves the result of accidental alterations in the form of the uterus. Of this class of cases retroflexion of the uterus is a most marked instance. Here we have a distinct, palpable change in the outline of the uterus, resulting from a fall, a strain, or a soft condition of the organ, predisposing it to become easily changed in its form on application of a slight force. The organ becomes congested, painful, tender; motion aggravates the displacement, the pain increases, and the uterus gradually hardens, preserving the vicious shape it has thus accidentally acquired, and leaving the patient a sufferer, often—if unrelieved—for years.

Is it surprising if such be the real state of the case, that applications of a caustic nature to the *os uteri* prove quite unavailing in removing the suffering? or is it to be wondered at that the uterus, if left in its flexed state, remains a source of perpetual discomfort to the patient?

A priori reasoning on the matter, however, would be comparatively unconvincing did it stand alone. But that what has been now put forward conveys the truth is further supported by the fact which remains to be stated, that having treated many such cases on the principle alone of reducing the flexion, I have found such treatment almost universally successful in removing the symptoms.

Of late years the question of the treatment of retroflexion of the uterus has received much attention, and, a confessedly difficult disease to cure when in the chronic stage, much has been and can be done to remedy it. The most satisfactory method of treatment, on the whole, consists in the application of pressure behind the cervix uteri, maintaining the cul-de-sac of the vagina behind the cervix in a high position in the pelvis. A modification of Hodge's pessary answers this purpose very completely. The one used by myself consists of an oval-shaped ring, the length of which varies according to the case, having a gentle curve adapted to that of the vagina. The upper part of the ring prevents the descent of the fundus backwards, and by degrees the flexion is rectified. In some cases a short-stem pessary can be worn in the uterine canal, and retained there by attaching it to the vaginal ring; but on the whole the other method is more generally applicable.

The patient suffering from "irritable uterus" then need not be consigned to the sofa for an indefinite period. By the use of a ring-pessary well adjusted, locomotion is rendered easy and painless in by far the majority of cases. The tender, irritable state of the uterus subsides gradually, and we may hope even in the worst cases to restore the shape of the organ more or less completely. The uterine sound may be occasionally used to bend the uterus, but in the worst cases it cannot be tolerated at first. Maintenance of the horizontal posture is necessary in the worst cases, during the first part of the time the patient is undergoing treatment.—*Practitioner*, *Aug.* 1868, *p.* 89.

105.—CASE OF MAMMARY ABSCESS TREATED BY LISTER'S METHOD.

By Dr. George H. Williams, Rhyl.

Mrs. J., aged 27, a fine healthy woman, was confined four months ago of her first child; although it was a face presentation she did well; she suffered much from excoriated nipples while suckling. About a month ago she im-

prudently had a morning's washing, and stood in thin slippers; this brought on pain and throbbing in the left breast, and, in spite of active treatment, a large abscess formed a little above the nipple.

On Thursday, April 23rd, 1868, I opened it according to Mr. Lister's directions. My friend Mr. Price Roberts. who had not often seen this treatment, was present, and held the soaked rag. After pressing out every drop of pus, which was fully a large tablespoonful in quantity, the putty was immediately applied; the next day I dressed it, under the same process, when, to our surprise, there was not a drop of discharge on the dressings. On the Sunday following, the cavity had filled up and healed over, and the whole breast presented as soft and healthy an appearance as the other. It has continued so, the secretion of milk reappearing at the nipple, which the child takes readily. Under ordinary treatment with unguents, poultices, &c., it would have taken a fortnight or three weeks in healing. I have under similar treatment at present a case of sinus beneath the instep, communicating with the fourth metatarsal bone, of eighteen months' duration. I shall relate the results in a future number.—*British Medical Journal*, *June* 6, 1868, *p.* 556.

106.—OVARIAN NEURALGIA TREATED BY HYDROCHLORATE OF AMMONIA AND TINCTURE OF ACONITE.

By Dr. J. Warne-Curran.

Whilst acute inflammation of the substance of the unimpregnated ovary is of rare occurrence, having never myself, in either hospital or private practice, met with what one would be led to believe a genuine or an established case, thus believing that the *ovaritis* of writers on the subject is in character *chronic*, or perhaps in a few rare cases *sub-acute*, yet *neuralgia* of the *ovary* is far from uncommon. By neuralgia of this body, I mean that class of ovarian disturbance which Dr. Churchill has described under the nomenclature of "*ovarian irritation*," and to that which Dr. West applies the simpler designation of "*ovarian-pain*," to me *ovarian neuralgia* appears a preferable and more correct term. Clinical observation has taught that the disease is independent of any local lesion, and more remediable by constitutional than any other mode of treatment. My object here is not to enter into those cases of *ovarian neuralgia* dependent on defective moral training, and where a strictly moral treatment is to be enforced, and undue connubial excitement checked, but those cases where the patients' sufferings are constant and severe, when there is no hysterical temperament, and no obvious symptoms of imprudence or immorality. My object, also, as briefly as possible, is to enter upon the treatment of such cases, and to illustrate, by the history of the six following, the great benefit to be derived from the muriate of ammonia and tincture of aconite in the treatment of this affection, when leeching, purgation, antispasmodics, vesicants, sedatives, internally administered and locally applied, had signally failed.

Case 1.—R. A., aged 27, of sedentary habits and chlorotic appearance, unmarried, sought advice for a severe and constant pain suffered in the left iliac fossa, had been under another medical gentleman for ten days, from whose treatment she stated she had experienced no benefit. The pain was dull and aching in character, occasionally passing along the anterior surface and inner side of the thigh; has not slept for a week; the appetite is impaired, but the secretions are all healthy; the tongue has a characteristic nervous coating, and the pulse is quick; there is no hysteria. Upon examination, I find a fullness in the left iliac region, with tenderness. I ordered the application of liniment, belladonna with chloroform, over the seat of pain; prescribed a saline aperient mixture, containing tincture of belladonna and a sedative draught at bed-time. For three days this treatment was persevered in, but there was no relief to the symptoms; the only ease experienced was when the patient lay flat on the face. I then applied a blister over the seat of mischief, gave opium, cannabis indicis, and camphor, in the form of pill, and tincture of conium in

mixture. The following day there was an aggravation of the symptoms; the patient had spent a restless night, and the relatives became anxious. Upon this I prescribed an eight-ounce mixture, containing two drachms of the muriate of ammonia, with five-drop doses of tincture of aconite. The combination seemed to act magically; before the bottle was finished the pain was gone. Sulphate of iron and quinine was afterwards given, and four months have now elapsed without any return of the complaint.

Case 2.—A. L., aged 19 years, single, of a full habit, and hitherto healthy, became affected with a violent pain in the left groin, for which immediate advice was required, as the woman in attendance dreaded the existence of a hernia. On being visited I found the pulse high, and the usual symptoms of inflammatory fever. She had suffered severely four months previously to being visited, and had passed no water from the commencement of the attack; vomiting was a constant and distressing symptom. On examination I found slight swelling on the left side, with intense pain on manipulation; the tenderness extended below Poupart's ligament. Having satisfied myself that there was no rupture, I ordered turpentine stupes to be applied, and directed her to have a warm hip-bath, and a mercurial aperient. The following day, as there was no progress towards amendment, I applied six leeches over the site of pain. This gave temporary relief, but towards evening the pain became if anything more severe. I found her, on being visited, on her hands and feet out of bed, apparently suffering most acutely. I prescribed her a draught containing twenty drops of cannabis, and immediately placed her on the muriate of ammonia and aconite mixture. The ensuing morning she expressed herself considerably relieved, but the tenderness remained, at times the pain recurred, producing vomiting when it did so. The patient got on remarkably well until the menstrual period arrived, when the same state of things occurred over again; but under the muriate of ammonia and aconite much was done to arrest the disease. She has had a menstrual period since without any recurrence of the pain.

Case 3.—A. R. F., aged 22 years, married for the last fourteen months, has long suffered from chronic ovarian pain, increased during the menstrual period. Has taken, to use her own words, "no end of medicine," and has been under the treatment of various physicians, "who all told her the same thing." I prescribed at once the muriate of ammonia and aconite; two bottles in the course of six days entirely removed the pain. Six weeks have elapsed, a menstruation passed with little pain, and at the present time (July 14) I learn from the woman, who came with another patient, that she has entirely recovered, and has had no return of the pain since she finished the last mixture.

Case 4.—J. L., married, aged 40 years, has suffered from ovarian neuralgia for a number of years. At times the pain is unendurable; during its existence there is fulness and tenderness over its site. Having been under treatment for an hepatic lesion, and obtained the above information in the history of her case, I told her, when the ovarian neuralgia returned, to apply, and I should prescribe for its relief. She accordingly did so in the course of time, and from the muriate of ammonia and aconite she obtains almost immediate ease.

Case 5.—G., about 25 years of age, single, has suffered from the time of her first menstruation with ovarian pain, causing frequent and painful micturition, with vomiting. Gave her the muriate, and had the satisfaction of hearing her express that she obtained instantaneous relief after its administration. Has suffered from subsequent attacks, which invariably yield to the medicines advocated.

Case 6 is furnished to me by a professional relative. It is that of a woman, aged 30 years, who has borne three children, and has laboured under ovarian suffering for a term of years. She has been a constant patient of my informant. He had "exhausted the Pharmacopœia," as stated, but with no benefit. Upon the exhibition of the muriate and aconite, the symptoms directly yielded to treatment, and the woman was relieved from much periodic suffering, and the physician re-established the confidence hitherto placed in him.

Although I am at a loss to account for the inexplicable property possessed

by the muriate of ammonia in curing ovarian neuralgia, I can unquestionably vouch for its efficacy in the same way as the French and German authors first bore out its high character and undeniable specific action as a stimulant in mucous fevers, when the inflammatory symptoms have subsided.—*Medical Press and Circular, Aug.* 19, 1868, *p.* 162.

107.—TWO CASES OF INCONTINENCE OF URINE FROM EARLIEST CHILDHOOD, CURED BY MECHANICAL DILATATION.

Under the care of Dr. Braxton Hicks, at Guy's Hospital.

A cause of incontinence of urine is indicated in the following cases which is not generally recognised. The treatment which Dr. Hicks applied was very successful, and we have no doubt that the record of it will be of great service to practitioners who have patients suffering from this very troublesome condition.

Case 1.—M. A., about 22 years old, had suffered ever since she can remember from nocturnal incontinence of urine, and almost incessant desire to micturate during the day. Had been under a great amount of treatment. She was admitted into Guy's Hospital under one of the surgeons, who examined for stone, but found none, nor any disease of the bladder, but a contracted one. Dr. Hicks offered to take charge of her. He began first by injecting solution of morphia, which lessened the irritability to a great extent, so much so that she was free for two or three nights from her distress. However, no further progress was made, but rather retrocession. Dr. Hicks then ordered the bladder to be distended as much as possible by plain warm water. This was done by his clerk, Dr. Chas. Smith, very carefully, daily. Almost directly she derived benefit, and in the course of a week she was quite well. The treatment was kept up for a week or more, and she went out. After three months the nocturnal incontinence returned, and she was readmitted; but the bladder became rather more irritable. Morphia was again used, but not acting so well as before, an injection of nitrate of silver, twenty grains to the ounce of water, was employed. This caused some pain after, but in a week she improved, with occasional trouble at night. She could hold half a pint of urine at a time in the day, but not so much at night. However, by an occasional injection of morphia she gradually regained the power of retention, and went out again free from her complaint. It was curious that for two or three days during the latter part of her treatment she was troubled with complete retention of urine; this, possibly, was of a nervous character.

Dr. Hicks remarked that the constant evacuation of urine permitted by some mothers to their children allowed the bladder to become so constantly empty, that after a time the muscular power of the sphincter was not sufficient to counteract the contractility of the organ. In recent cases, no doubt this could be voluntarily overcome by adults; but in old-standing cases, although we might do much by lessening the sensibility of the bladder, yet we might proceed at once to overcome its resistance by mechanical force, so that further treatment would not be required. This was strongly shown in the following case, which recently was under his care in Guy's Hospital.

Case 2.—The history was precisely similar to that of the last. The bladder was at once injected with water; it shortly held half a pint. The incontinence was rapidly cured; and the patient went out to service.

Both these girls had been unfit for service from their complaint. Dr. Hicks suggested the applicability of this treatment to both sexes, in cases with similar history; at any rate, it would be harmless unless violence were used. He thought it was possible that in some of the cases there were congenitally small bladders, and these possibly might be more difficult to manage.

There is much more difficulty in treating the contracted state of the bladder in chronic cystitis. A great deal can, however, be effected by injections of various kinds, as was shown in the following instance:—

C. C., aged 26, had cystitis after delivery, which caused her great pain, and intense desire to void urine every half hour. Various remedies were tried: styptics and sedatives to the interior of the bladder. Nitrate of silver injection (thirty grains to the ounce) was the most beneficial. The distress it caused was considerable; but she preferred it, as giving most subsequent relief. Morphia solution was always left in afterwards; and also at other times, to lessen the sensitiveness occasionally; mechanical distension was employed, but it was found nearly impossible to inject beyond three ounces at any time. After two months she could retain urine for nearly three hours, when Dr. Hicks thought it might be possible to distend the bladder to a greater extent under chloroform. This was tried; but three ounces was the greatest quantity admitted. There was a good deal of irritation after, and she was not so well as before. After a week she could hold her water only for an hour and a quarter. Afterwards she improved, and could manage to retain urine for an hour and a half, when she left the hospital.

Whether the resistance of the bladder was simply from thickened walls, or from this and inflammatory adhesions also, did not appear clear in the case. The resistance was very firm. She had, however, gained something altogether by the treatment; but not so much as she would have done had no attempt been made to distend the bladder.—*Lancet*, *July* 4, 1868, *p.* 7.

108.—NÆVI IN CHILDREN TREATED BY ACTUAL CAUTERY.

Mr. T. Holmes has recently had two cases illustrating the advantage of this mode of operation. The cautery employed was that known as Wordsworth's, which consists of a steel needle springing from a bulb; the latter being brought to a white heat in a blow-pipe flame, it keeps the needle heated for a considerable time. The cutaneous part had been previously treated by nitric acid, and the subcutaneous had been partly removed by the ligature. The cautery was, therefore, employed to destroy a few remaining portions of the nævus tissue. The nævus was pierced in ten or twelve places, the needle remaining hot the while. The result was most satisfactory; there was no irritation nor suppuration. —*Practitioner*, *Sept.* 1868, *p.* 183.

ADDENDA.

109.—ON THE USE OF CROTON OIL AS A COUNTER-IRRITANT IN HEAD AFFECTIONS.

By Dr. Robert S. Turner, M. A.

[Dr. Turner, whilst resident medical officer at the Sick Children's Hospital at Edinburgh, had opportunities of observing an unusually large number of cases of tubercular meningitis.]

Case 1.—Elizabeth Wilson, aged six years, was admitted into the Children's Hospital on the 21st of August, 1867. She was in hospital about five weeks before, suffering from measles, and although convalescent when dismissed had never regained her usual strength. About ten days before readmission, her mother said she had had a fit and afterwards attacks of "the nerves." She had complained for some time of pain in the head and bowels. The bowels were confined. Several children of the same family had died of phthisis in the hospital.

On admission the child was dull and sleepy, kept constantly grinding her teeth, and frequently started in her sleep. The pulse was slow and irregular. From the history and symptoms, the case was readily diagnosed as one of tubercular meningitis. The bowels were moved by an enema, and the stool was carefully examined for worms, but none were found; the hair was cut short, and cold applied to the head; she was ordered also to have two grains of iodide of potassium thrice a day. The symptoms increased in severity, and, three days after admission, she had a convulsion and became comatose, with stertorous breathing and strabismus. Dr. Weir, the physician on duty at the time (to whom I am indebted for liberty to report this and the two following cases), now ordered the head to be shaved and croton oil (one part of croton to three of olive oil) to be rubbed into the scalp. As soon as the croton eruption appeared the coma gradually passed off, and the child began to regain consciousness. She rapidly improved, and about a fortnight after admission was able to get up and run about. On the 15th of September, however, she was suddenly seized with a violent convulsion, and the head symptoms returned. Next day she had another severe convulsion, and died. A post-mortem examination was not allowed.

Case 2.—Helen Allen, aged five years, was admitted 21st August, 1867. Patient had been complaining of dizziness and headache, and had been losing flesh and appetite for about a month before admission. A sister died of tubercular meningitis in the hospital about a year before.

On admission her symptoms were much the same as those of Elizabeth Wilson, just described, and, in addition, she had vomiting and great intolerance of light. There were no worms in the motions, which were at first confined but afterwards loose. She was ordered cold to the head, and iodide of potassium. The symptoms increased, but not so rapidly as in the preceding case. About a week after admission she was decidedly worse. She lay on her back with her eyes turned up, and could not be roused without great difficulty. Her head having been shaved, the croton liniment was now applied, but, before the eruption had time to come out, her breathing had become stertorous, she had slight convulsions, and her urine and fæces were passed unconsciously. As soon as the eruption appeared, however, the symptoms

began to abate, and in a few days they had altogether passed off. In addition to the iodide of potassium she was ordered cod-liver oil. For about three weeks she continued well, but as the irritation of the eruption was passing off, she began to complain of headache and giddiness. The liniment was again applied, with the effect of relieving the symptoms, and the eruption was kept up for some weeks, during which time the patient appeared perfectly well. By the middle of October the irritation was again allowed to subside, and although the patient complained of a little headache, the croton oil was not applied till the 20th October. On that day she fell down in a fit, and her head was severely cut by coming in contact with the corner of a stool. Before the eruption appeared she had another less severe convulsion, but on its coming out fully she again got better, and continued so till she was dismissed on the 26th of November.

Case 3.—Andrew Armstrong, aged two years and nine months, admitted 2nd September, 1867. The history was the usual one of tubercular meningitis—irritability, loss of flesh, starting, and grinding the teeth during sleep.

On admission he was in a semi-comatose state, and the pulse and respiration were irregular. His head was at once shaved, and the croton liniment rubbed into the scalp, and he was ordered two grains of iodide of potassium thrice a day. Next day the coma had become deeper, and squinting had come on; so ill was he, in fact, that it was considered hopeless to apply the croton oil again with the view of hastening eruption. On the following day, however, the eruption began to appear, and, as in the other cases, the patient was well in a few days. The irritation was kept up for some time by a weaker liniment. He recovered without a bad symptom, and was dismissed on the 5th of October quite well.

Case 4 was that of a child about three years old, whom I saw in the outdoor department of the hospital. I have no notes of the case, and therefore I am not able to detail the symptoms; but they were of such a nature that, taking the history also into account, Dr. Caton, then assistant to the extra physicians, and myself had no hesitation in ascribing them to tubercular meningitis. Directions were given to have the head shaved and a croton-oil liniment rubbed into the scalp, and iodide of potassium was ordered internally. The child soon got so much better that attendance at the hospital was stopped, and he continued well till the eruption on the head disappeared. About a fortnight after his last visit to the hospital he became much worse, and his mother wrote requesting that he might be attended at his own home. By some accident the letter was not delivered till three days after, and, when I got to the house where he lived, I found another medical man in attendance, who said he was treating the child for acute hydrocephalus.

Case 5 was seen more recently, and is at present in the Infirmary under the care of Dr. Grainger Stewart, who has kindly allowed me to refer to it.

William Macintosh, aged 36, an engraver, was admitted into Ward 6, 22nd January, 1868. Two years before admission, he sustained an injury on the head by falling down stairs, from the effects of which he was laid up for some days. Afterwards, although able to work, he occasionally had fits of headache, with shivering and loss of appetite. In the end of August last he was exposed to cold and wet, and for about six weeks after had a severe headache, with occasional loss of consciousness and convulsions, which occurred two or three times a day, and lasted for about five minutes each time. By the end of November he had got better, but on the 24th of December he had a violent convulsion, and from that time became gradually worse.

On admission he was in a dull, drowsy condition, and could be roused only when spoken to sharply and loudly. When answering questions, he spoke very slowly and indistinctly. He complained of pain in the head. The pulse was slow and irregular. The bowels not having been moved for some days, he was ordered a large dose of castor oil. Next day he was much in the same state, or rather worse. The castor oil had not acted, and an enema was ordered. The head was shaved and croton oil rubbed into the scalp. On the 25th he was much worse, the urine and fæces being passed in bed. The eruption had not appeared on the scalp, and the liniment was again rubbed

in. By the evening of the 26th the pulse had become quick, and the breathing stertorous, and he was to all appearance moribund. The scalp, however, was becoming inflamed. Next morning, while his friends were watching to see him die, he suddenly looked up and told them to take away the "dead-screen," which had been placed round his bed. By visit-hour he had got much better, being able to answer when spoken to, and from that time he rapidly recovered. Since then he has had occasional attacks of headache and giddiness, accompanied with indistinctness of speech, but these have always been relieved by the croton eruption.

In all these cases there was undoubtedly some serious affection of the brain or its membranes, and in all of them the disappearane of most grave symptoms occurred simultaneously with the appearance of the croton eruption; not only so, but as the eruption began to fade, the symptoms returned, presenting the "waxing and waning" phenomena of logicians. The relation between the two was so marked that I cannot believe it was other than that of cause and effect. The disappearance of the symptoms cannot be accounted for by supposing it due to the iodide of potassium alone, for this drug has often been used in the same circumstances without effect; and in the last case it was not given till the patient had been roused from coma, and was beginning to get better. I do not deny that it may have had some influence in the ultimate recovery of the patients; but had they not been roused, and the inflammation within the cranium subdued, as I believe it was by the croton eruption, the action of the iodide would not have been established before the death of the patients. As far as I could observe, there was no other circumstance which in any way influenced the course of the cases.

On looking into the literature of this subject, I find that croton oil has been used before in the same way, and with equally good effect. Dr. Watson, of Southampton, in the British Medical Journal, for 1859, records a case where acute hydrocephalus occurred after the suppression of an eruption on the scalp, which he treated by this means, and which ultimately recovered. In the New Sydenham Society's Year-Book, for 1859, reference is made also to a paper on Tubercular Meningitis, by a Swedish physician, Dr. Bang, in which he recommends counter-irritation by croton oil or tartar emetic, having seen, he says, good results from both.—*Edinburgh Medical Journal*, *Nov.* 1868, *p.* 434.

110.—THE SPINAL ICE-BAG IN THE TREATMENT OF DELIRIUM TREMENS.

By Edward Hamilton, Esq., one of the Surgeons to Steevens's Hospital, Dublin.

[The treatment by the spinal ice-bag was adopted in consequence of a communication made to the Surgical Society of Ireland by Dr. D. B. Hewitt. Mr. Hamilton says:]

I was called to see Mr. T. S., the proprietor of a tavern in the suburbs, and found him with all the symptoms of *delirium e potu* well pronounced; he was in a state of great excitement and could with difficulty be controlled; pulse 120, weak; hands tremulous; face pale; tongue large, soft, and creamy. He laboured under the hallucination that his wife's coffin was always beside him, and that he was himself dead and should be placed in it. In addition to this state of the nervous system, he suffered from very considerable derangement of the digestive organs, his eyes were icteric, he had vomiting and hiccup, with much tenderness over the right hypochondrium. He had been for some time an habitual tippler, but on the death of his wife, some short time previously, he took to drink continuously. Has had a slight attack before the present. He has had no sleep for the last three nights. A blister was applied to the epigastric region. He was ordered to take a draught every third hour, containing twenty drops of tincture of cannabis indica, two drops of dilute hydrocyanic acid in camphor water; by this treatment the vomiting was relieved, but the patient had no sleep; in the evening he was ordered two grains of watery extract of opium in a tumbler of brandy punch,

to be repeated in six hours if sleep was not procured. The following morning I found him still labouring under great excitement, having had no sleep. The skin was clammy and bedewed with cold perspiration, the pupils were contracted, pulse 120, weak; it was evident that in his present condition narcotic treatment could not be further pushed with any degree of safety, and yet the exhaustion from want of sleep was sure to be fatal. Accordingly I procured one of Dr. Chapman's ice-bags, and, having filled it, applied it to the back from the occipital bone to the lumbar regions, having passed the elastic band round the forehead and secured the lower end with a bandage round the waist, giving directions that it should be renewed when the ice had melted. He was placed in bed, the room darkened, and strict quietness enjoined. In the morning, after the ice was applied, he became quieter and more manageable, being, as his attendant expressed it, "cooled down;" at the same time the temperature of the surface was sensibly raised. In a quarter of an hour after the second charge of ice was applied he fell into a deep sleep, which lasted for eight hours. On waking he expressed a wish for food; he had a broiled chop and some bread, and on my evening visit I found him again sleeping naturally. Abstemiousness quickly restored his digestive organs and brought him to his ordinary health.

I was requested by Mr. W., residing some distance from town, to see his head gardener, who was labouring under an attack of delirium tremens. I found him walking round his room in wild delirium; his brother, who was in attendance on him, found the greatest difficulty in restraining him, as he made violent efforts to escape from the room. I had seen him in two similar attacks, but in neither was the excitement so great as on the present occasion. The plan of treatment which was adopted in his previous illness was resorted to: he was given a dose of castor oil and turpentine, and at night, three grains of watery extract of opium in a glass of punch; on this occasion it was not so successful. I was sent for to see him again the next day, as he had had no sleep in the night, nor for the three nights previously, and was stated to be much worse, the opiate had rested on his stomach; but I found him still violent, pulse 100, skin clammy, pupils contracted; his bowels had been well cleared out. I resolved to try the ice to the spine, but not having the india-rubber bag with me, although ice was easily procurable, I obtained the trachea of a cow from a butcher in the adjoining village, and it answered the purpose admirably—the ends were plugged with cork and lapped over with twine. It was applied to the nape of the neck and down the back. After the third application he fell into a sound sleep, which lasted for six hours, and was followed by complete recovery in a few days.

J. H., proprietor of a public-house in Dublin, usually of moderate habits, became much depressed at the death of his brother, to whom he was greatly attached, and took to drink. He was a man of weak constitution and delicate, although not subject to any special ailment. I found him suffering under great depression; pulse 60, skin cool and moist, tongue peculiarly furred in patches, stomach instable. No sleep for the last two nights. He was rational, except at intervals, but was not violent. He was ordered tincture of cannabis indica, chloric ether, and camphor water, every third hour, and at night to take one grain of watery extract of opium every third hour; to have four ounces of wine and strong beef-tea. I saw him the following morning, he was more excited, pulling the bed-clothes, and very restless. He did not sleep, although three of the pills were given to him; his pulse was 80; he complained of headache and great thirst. He was allowed ice in his mouth. The ice-bag was applied to the spine, as in the case above. In half an-hour after the first application he slept soundly for several hours, and in the course of the night, his friends, finding that he was not inclined to sleep, and having witnessed its good effects, of their own accord, applied the ice with the best possible result, as he slept the entire night and was convalescent on the following day.—*Medical Press and Circular*, *Sept.* 30, 1868, *p.* 291.

111.—CARBOLIC ACID IN CUTANEOUS DISEASE.

By Dr. F. P. Mann, Brooklyn, N. Y.

[The use of carbolic acid is of course likely to be especially useful in those forms of skin disease depending upon, or accompanied by, the development of any of the forms of fungi.]

Case 1.—*Chronic Eczema.*—The patient, a child six months old, nursed by its mother, a young and apparently healthy woman. Eruption first appeared upon the scalp, when the infant was two and a half months old. The nurse applied olive oil, cleansing the head daily with Castile soap and tepid water; the eruptions, however, progressed rapidly, and when I first saw the child, namely, three and a half months from the time the disease commenced, not only the head but the entire trunk and extremities presented a most pitiable appearance. The thin, soft incrustations, more broad than prominent, of eczema impetiginodes, occupied the head, back, chest, and limbs, while here and there a fresh group of vesicles of eczema simplex pointed out most pathognomically, the true nature of the eruption. The evacuations were variable, sometimes of natural colour, at others persistently green, and always very acid, as shown by litmus; on examination by microscope, they were found to contain milk corpuscles in abundance, mixed with casein, that separated by the lactic acid of the stomach, had passed into the duodenum undigested, and mingling with the bile, had drifted through the intestinal canal. The urine was examined chemically, and by microscope; it was highly acid, depositing urates freely; a few drops evaporated on a glass slide gave glomeruli and isolated crystals of uric acid. The serous exudation beneath the incrustations was also highly acid. The milk from the mother of the child was also carefully examined; it contained an abnormal quantity of lactic acid, though the corpuscles did not coalesce, it gave an acid reaction to neutral litmus. Under the influence of thoroughly alkaline treatment, namely, baths with bicarb. soda, and bicarb. potass. internally, three times per day, in quantities sufficient to completely neutralize the acid reactions of the dejections, urine, and serum from the eruption (an alkali was also given to the mother), so rapid was the improvement, that within ten days, the scalp was free from disease, and the irritation of the surface everywhere much abated.

Fresh groups of eczema simplex, however, continued to be reproduced upon both body and limbs. I then determined to try the effects of carbolic acid as a parasiticide, having recently tested its power in the destruction of the penicillium glaucum, and torula cerevisiæ; accordingly, a solution containing half a drachm of carbolic acid in four ounces of water, was applied three times per day to the eruption. The effect was immediate; the vesicles disappeared promptly, producing a slight exfoliation, and did not return, except a few groups about the neck, which two or three applications of the solution removed.

Case 2.—*Impetigo.*—The patient was a child of ten months old, of strongly strumous diathesis; the psydracious pustules were developed upon the upper lip, and about the mouth, while from the nares issued a sanious and very acrid discharge. The carbolic acid, same strength as before, was used freely upon the eruption, and the nares were also injected with the solution; the effect was quite as marked as in the former case, the pustules withered, and soon altogether disappeared, leaving the skin free from irritation.

Case 3.—*Psoriasis inveterata.*—Two years standing; patient a stout girl 15 years of age, body and limbs covered with the eruption. Ordered Donovan's sol. carbolic acid to be applied every morning in proportion of one part of the acid to four of water, body to be sponged with Castile soap and warm water, prior to its application. In three weeks from the date of the first application, not a vestige of the eruption remained. How far the Donovan's solution assisted in producing this rapid convalescence from one of the most obstinate of all cutaneous diseases, I leave others to judge.—*New York Medical Journal, Sept.* 1868, *p.* 515.

112.—THE HYPODERMIC INJECTION OF REMEDIES.

By Dr. Francis E. Anstie, Senior Assistant Physician to Westminister Hospital.

[The subcutaneous mode of administering medicines is still very much unappreciated, not however by those who have given it a fair trial.]

First, as to the question of *danger*, let me say, positively, that there is *absolutely none* if the injector will remember two cautions:—first, that the physical activity of nearly every substance which can be thus used is *three if not four times greater when it is given by the skin than when it is swallowed;* and secondly, that the liquid injected must not be either markedly acid nor markedly alkaline, nor in any way obviously *irritant to tissue.* The only case of serious inconvenience which has occurred among the hundreds of injections I have made was the formation of a small abscess in the cellular tissue of a gentleman in whom I injected *chloroform*, an agent entirely unfit to be used in this way, as I am now aware.

The advantages of the hypodermic over the gastric administration are these:—1. Economy of the drug. 2. Entire abolition of the depressing or irritant effects which are locally produced in the alimentary canal during the *digestion* of various remedies. 3. Far greater *permanence of effect*, in many cases, than can be produced by medicine swallowed. 4. Much greater rapidity of action—a quality which makes injected remedies of priceless value in certain emergencies. One most important conclusion from these facts is this, *that anodynes and hypnotics ought never to be administered by the mouth in acute disease attended with anorexia.* The practical importance of this principle is immense. Regular and systematic nutrition is the great necessity and the great difficulty in these diseases, and the avoidance of any treatment tending to interfere with digestion of simple food is a cardinal duty.

I shall first say a few words as to the operation of hypodermic injection, and then say a little about particular drugs.

The three kinds of syringe recommended by the Medico-Chirurgical Society's Committee (namely, Coxeter's, Whicker and Blaise's, and Weiss's) are each of them sufficient and good. The ideal syringe perhaps is a Coxeter, with the addition of a screw-joint by which the barrel can be removed and refilled without withdrawing the canula from the skin. Such an instrument is so cheap as well as handy that the surgeon can afford to have two, in case of breakages: and breakage does not inflict very large expense. A country doctor should never start on his rounds without a syringe and a bottle of morphia solution, such as will be described presently. He should have one or two steel canulas, besides the gold ones ordinarily used; these are useful to penetrate tough skin, especially skin which has been frozen with ether spray, a necessary preliminary with some sensitive patients.

The best *mode* of making the injection is that described by Mr. Charles Hunter, to whom we owe so much of our knowledge on the subject, viz.: to pick up a fold of loose skin and push the canula right through till its point works loosely in the subdermic cellular space; then inject slowly with two or three pauses of a second or two; wait one minute, and then withdraw the canula slowly, pressing firmly with the finger on the track and keeping it applied to the puncture for a minute or two. It is a mistake to apply plaster (except in the rare instance where a large quantity of fluid has to be injected), for it leaves an ugly mark on the skin for some days. However, it is not always possible to find a convenient loose fold of skin, and in this case another plan must be adopted. The skin must be strained to one side with the thumb, and the canula run in with a steady pressure; the disadvantage of this procedure is that it is rather more painful, and that we are not sure of getting into the subcutaneous cellular tissue: failing this, it is rather more difficult to get the fluid in; the injection must be more slowly performed, and it may be necessary to apply plaster to prevent its escape.

[In the vast majority of cases it is a matter of indifference as regards the effect on the pain, where we inject, provided we select a favourable place for

absorption, and vary the place of injection each time in order to avoid local irritation. When, however, the painful part is a convenient place for injection it is well to perform it locally.]

And now with regard to the drugs that can be used. Those which I have myself employed are opium, morphia,* and codeia, atropine and its sulphate,* veratrine,* caffeine,* camphor,* Indian hemp,* strychnine,* aconitine, as hypnotics or anodynes; quinine* both as anodyne and antiperiodic; podophyllin as a purgative; prussic acid* as a calmative in vomiting; corrosive sublimate* in congenital syphilis; arsenic* and atropine* as anti-spasmodics. Besides this, woorara and nicotine have been successfully used by others for tetanus; conia for asthma and angina; digitalis for various febrile conditions; tartar emetic as an emetic, &c. Among those which are mentioned as having been employed by myself, all those marked with an asterisk have been found useful; the rest proved either inert or superfluous. As it would be quite impossible here to detail the results of all these experiments, I shall confine my remarks to two drugs which are comparatively well known, and two other drugs which are very little known, but will probably prove most important, as hypodermic medicines. The first two are morphia and atropine, the others strychnine and caffeine.

1. Morphia should be used in the form of acetate, dissolved with a minimum of acetic acid in hot distilled water, five grains to the drachm. As the salt varies in solubility it will often happen that on cooling the solution will solidify: this is not of much consequence, as it can be heated in hot water at the moment of use. Ten grains to the drachm can easily be dissolved by the use of *glycerine:* but in the first place (according to my experience of the doses which are most useful) this is needlessly strong for any but quite exceptional cases; and secondly, an important question has suggested itself to Dr. Lawson, which I have not yet had time to settle decisively, whether the influence of glycerine does not diminish the physiological activity of morphia salts. I confess that I have grave suspicions on the matter; and meantime the five-grain preparation answers extremely well. One minim of this will represent one-twelfth of a grain, a very useful minimum dose in cases of slight neuralgic pain. Two minims ($\frac{1}{6}$ grain) is the best commencing dose for the relief of severe pain, and as a hypnotic in states of nervous irritability. Three minims (or $\frac{1}{4}$ grain) is an *unsafe dose to commence with:* dangerous and even fatal results have been known to follow its use. It should not be given till smaller doses have been tried. It can rarely be advisable to increase the dose above six minims ($\frac{1}{2}$ grain) except in the case of persons habituated to indulgence in opiates.

The advantages of the hypodermic injection of morphia over its administration by the mouth are immense. The salt, used in this manner, is at least three times as powerful, for every therapeutic purpose, as when swallowed; and, meantime, the majority of the unpleasant symptoms which opiates can produce are entirely absent. The fact seems to be, that in the gastric digestion of morphia much of the salt becomes decomposed, and its specific effect on the blood is lost; but during the digestive process it acts depressingly upon the gastric nerves, and *pro tanto* disorders the functions of the stomach. In acute diseases, and especially in delirium tremens, we ought never to give opiates by the mouth when subcutaneous injection of morphia is possible.

The advantages of morphia hypodermically administered over opiate medication by the stomach are such as would be *à priori* incredible, nor can they as yet be fully explained. In particular, it is impossible to account for the far greater *permanence* of its action in relieving nerve-pain, which is so marked as that its discovery has initiated quite a new era in the treatment of severe neuralgias. Affections of this kind, which under any of the older plans of treatment would at least have been very tedious, are sometimes cured after three or four injections of $\frac{1}{6}$ grain each; and very many yield after a week or ten days of such injections, repeated twice daily. Even the inveterate and incurable "epileptiform" facial tic may be so benefited, that life, from being a horrible and intolerable burden, may become, not cheerful indeed, but comparatively peaceful and calm. Moreover, it is certainly the

fact that there is far less tendency with hypodermic than with gastric medication to rapid and large increase of the dose, when morphia is used for a long time together. And the "antiphlogistic" virtues which have been ascribed to opium would certainly, if ever, appear to be verified by the effect of hypodermic injections of morphia in threatening pericarditis, pleurisy, &c.

2. Atropine is an extremely valuable hypodermic agent for the relief of local pain and spasm. It should be employed in the form of solution of the sulphate: four minims containing $\frac{1}{60}$ grain; two minims will be the proper commencing dose in adults, unless the pain to be relieved is very severe. It should be cautiously increased to $\frac{1}{60}$ or $\frac{1}{50}$ grain; more can seldom be needed, and very uncomfortable poisonous effects may easily be produced if it be pushed to higher doses. *Apropos* of dosage, it is a positive duty here to notice one of the most astounding blunders ever committed by an eminent teacher —a blunder by no less a man than M. Trousseau—which, if not corrected, might lead to most seriously mischievous, or even fatal, practice. M. Trousseau makes the amazing statement that atropine is less active by the skin than by the stomach, and that as much as $\frac{1}{10}$ *or even* $\frac{1}{8}$ *of a grain may be used without causing inconvenience.* He even proceeds to say that the same rule applies in the case of morphia, which is similarly more active by the stomach than by the skin! This is Homer nodding with a vengeance; and one can only hope that scarcely any one has read that part of M. Trousseau's otherwise excellent paper. Otherwise, the consequences might have been very grave, if we consider that $\frac{1}{4}$ of a grain of morphia has once proved fatal, and many times dangerous, and that the most serious symptoms have been induced by $\frac{1}{60}$ of a grain of atropine. Indeed the slighter symptoms of atropism, which fortunately are of no serious moment (dryness in the throat, vertigo, and diplopia), are occasionally produced by doses three or four times smaller than this. Their appearance is an indubitable sign that it would be unsafe to push the remedy in larger doses.

Atropine is not a direct hypnotic, though it often makes sleep possible by relieving severe pain. It holds to morphia a notable relation in the series of hypodermic remedies for pain.

It is somewhat less frequently tolerated (in doses which are sufficient to relieve pain) than morphia; but it is an interesting and very valuable fact, that persons who are quite unable to bear morphia will often bear atropine, and *vice versâ;* and even in cases when both remedies are tolerated, we sometimes find morphia, and sometimes atropine (the latter most frequently), producing a *permanent* effect. This relation, which I have often noted, has been remarkably illustrated in two cases which have been under my care during the last few days: one was a case of severe neuralgia attending shingles, and the other a case of extreme neuralgic pain from long impacted calculus in the ureter. In both cases morphia failed, and in the latter it always caused most unpleasant toxic symptoms, while atropine produced the most beneficial results in doses of $\frac{1}{60}$ and $\frac{1}{100}$ of a grain, respectively. I have also obtained excellent results with atropine in a case of spasmodic asthma, when opiates could not be tolerated in any shape; and, on the other hand, a case was lately under my care of sciàtica in a young lady, when morphia acted beautifully, though atropine could not be borne even in the dose of $\frac{1}{100}$ grain.

A special hypodermic application of atropine which appears to me to promise the most valuable results, is its use in painful iritis, and especially in threatening glaucoma. I firmly believe that in two cases I have succeeded in preventing the latter affection from developing itself; at least the most threatening symptoms were present, and rapidly subsided under the use of one-sixtieth grain injections of atropine.

Finally, I may remark of atropine that it is incomparably the best of all medicinal remedies for every kind of pain in the pelvic viscera. Nothing can approach it in this respect.

3. *Strychnia* has been used by me in quite a different class of cases to that for which only, so far as I know, it has been used by others. I have seen no valid reason for using it in *paralysis*, as many have done. But I have tried and proved it to be a most valuable remedy in certain varieties of neuralgic

pain, viz., gastralgia, and neuralgia of the heart. The proper form is a solution of sulphate of strychnia, 2 grains to the ounce of distilled water, and the proper commencing dose is two minims ($\frac{1}{120}$ grain). The doses recommended by Eulenburg for paralytic affections are much too large for anodyne purposes, and we risk unpleasant toxic effects if we carry the dose beyond one-sixtieth of a grain. My decided opinion is, at present, that there is no such remedy for gastralgia as strychnia, subcutaneously injected in doses of $\frac{1}{120}$ to one-sixtieth of a grain.

4. The last hypodermic agent I have to refer to is caffeine, which I have employed in two cases of neuralgia and one of insomnia from chronic alcoholism. The dose employed in each case was one grain. In one instance of severe neuralgia of the superficial branches of the circumflex in the shoulder, two successive injections of caffeine (over the biceps) appeared to cut short the malady altogether. In a case of dorso-intercostal neuralgia attending shingles, the patient was injected daily for five or six days, with the effect of notably mitigating the pain on each occasion. And in a woman who had drunk to great excess for years, without ever having distinct delirium tremens, but could not sleep at all, and was a prey to distressing visual hallucinations, a notable improvement was effected by caffeine. She was injected twice a week for three weeks, and on each occasion got great temporary relief, which various other remedies (quinine, ether, morphia) failed to produce. Unfortunately, she then ceased to attend. I cannot but entertain the hope that caffeine may prove a very valuable remedy, both in neuralgia and in alcoholic insomnia.—*Practitioner*, *July*, 1868, *p.* 32.

113.—ELECTRO-THERAPEUTICS.

[The following article by the Editor of the British Medical Journal gives to some extent an outline serving to indicate the present state of electro-therapeutics.]

Frictional electricity, though formerly much employed in medicine, is now entirely superseded by the use of the Galvanic and Faradic currents. Galvanism, or the galvanic current, is the term applied to that form of electricity which is derived from the contact of two heterogeneous metals immersed in a fluid which exerts a chemical action on one of them. Faradism, or the faradic current, is the term used to designate the electrical currents which are *induced* in a coil of conducting wire when a magnet is brought near to or removed from it, or by the formation and the rupture of a galvanic current passing through another coil near but not in contact with the first.

The galvanic current will continue as long as the chemical action in the battery; hence it is often termed the *continuous* or *constant* current. On the other hand, the faradic current is instantaneous; and, because it is produced by induction, the term "induced current" is used by many authors to designate it. On the whole, it seems advantageous to adopt the two terms galvanism and faradism, as indicating the two kinds of electricity used in medicine; and to speak of the therapeutical employment of the one as galvanisation and that of the other as faradisation.

Many kinds of batteries might be used to generate the galvanic current; but that invented by Daniell is the best, on account of its cleanliness and cheapness. Each cell of the battery contains a plate of copper immersed in a solution of sulphate of copper, kept saturated by a quantity of crystals of the same, and a plate or cylinder of amalgamated zinc immersed in dilute sulphuric acid (one of ordinary sulphuric acid to eight or ten parts of water). The acid is separated from the copper solution by a porous clay cell. When a number of elements are employed, the zinc or negative pole or electrode of one cell is joined to the copper or positive pole or electrode of another cell.

To obtain the inducted or faradic currents, we may use a rotatory magnetic machine, in which coils of wire surrounding cylinders of soft iron are

caused to revolve before the ends of a permanent steel magnet. The induced currents obtained from this machine are recommended by Dr. Althaus (Treatise on Medical Electricity, p. 202. London: 1859) for the treatment of some cases of deficient vision and rheumatic callosities. By a number of distinguished electro-therapeuticians, however, this apparatus is not used, because it is apt to get out of order, the currents obtained from it are of very inconstant strength, and the necessary turning of the handle is most wearisome.

The galvano-induction machines in common use are, therefore, to be preferred for producing the faradic currents. They consist of two coils of wire—one, a short coil of thick wire termed the primary coil; the other, a long coil of very thin wire, termed the secondary coil, which generally surrounds the first, but has no connection with it. The wire of the primary coil is connected with a galvanic battery, consisting usually of a Smee's or Daniell's element; and the current which circulates through the primary coil is termed the primary current, while that which is induced by this in the secondary coil is termed the secondary current. The influence of the primary current is much increased by a bundle of soft iron wire inserted within the primary coil; and the strength of the secondary current may be varied by pulling out or pushing in the bundle of soft iron within the coil. The strength of the secondary current may also be graduated with great nicety by varying the distance between the primary and the secondary coils. In Du Bois Reymond's induction machine, this mode is adopted: when a strong current is wanted, the secondary is placed so as to surround the primary coil; while, in order to obtain a weak current, the one coil is pulled away from the other. Du Bois Reymond's machine is the best for physiological purposes; for therapeutical ends, it is also excellent; but it is not sufficiently portable. For portability, Stöhrer's machines are perhaps the best. Everything required is packed in a small box, and, when the machine is put into use, nothing requires to be removed from the box. As the induced current is instantaneous, and only produced on forming or on breaking the primary current, an arrangement, termed a Neef's hammer, is employed to rapidly break and re-form the current in the primary coil. The term "interrupted current" is often used to designate a succession of faradic or inducted currents. This is a most misleading term, which ought to be abandoned, because the galvanic or continuous current may be rapidly interrupted, and in that case the term would as properly apply to the galvanic as to the faradic current.

In the faradic current, the electricity is of high tension, and is a much more powerful irritant than the electricity of low tension, which constitutes the galvanic current. When the thermal and electrolytic effects of electricity are wanted, *e. g.*, to heat a wire with which to remove a tumour, or to coagulate the blood inside an aneurism, the galvanic current is employed, because in it the electricity is great in quantity and low in tension.—*British Medical Journal, July* 11, 1868, *p.* 31.

114.—ARSENIC AS AN ANTIDOTE TO THE POISON OF SERPENTS.

In the second volume of the Medico-Chirurgical Transactions Mr. Ireland gives the result of a treatment put in practice by himself at St. Lucia, in the West Indies, in the treatment of persons bitten by a venomous serpent, the coluber carinatus of Linnæus. The bite of this creature was usually fatal in from six to twelve hours. His plan was to administer two drachms of liquor arsenicalis, equal to one grain of arsenic acid, with ten minims of laudanum, and an ounce and a half of peppermint water, in combination with half an ounce of lime-juice every half-hour for three or four hours; at the same time ordering a cathartic clyster every hour; and, after paring the edges of the wound, fomenting it, and then applying a liniment, consisting of spirits of turpentine, liquor ammoniæ, and olive-oil. In three or four hours purging was

established and the arsenic was stopped. Mr. Ireland treated four cases in St. Lucia, and one in Martinique, with the utmost success, and without a bad symptom. In one of the cases vomiting was induced, but the clyster was continued until purging was established, and then the vomiting ceased, and twenty minims of laudanum were exhibited, with fifteen of sulphuric æther and an ounce and a half of peppermint water. In the latter case, also, there was some irritability of the bladder and loss of power in passing urine. M. Chevalier, in his comments on this treatment, remarks that it does not "appear at all unreasonable that, where such sudden and extreme debility is produced as takes place from the bites of serpents, a much larger dose of a powerful remedy might be taken with impunity than could be borne in any ordinary state of the human frame." And he adds that he was led to recommend a trial of arsenic to Mr. Ireland, from the facts recorded in Dr. Russell's "History of Indian Serpents," on the authority of Messrs. Duffin and Ramsay, who state that the Tanjore pill is administered with considerable success in India after the bites of venomous serpents, the formula of the Tanjore pill being as follows, namely: arsenic, roots of vellinavi, roots of neri visham, kernels of nervalam, pepper, quicksilver, of each an equal quantity; the quicksilver is rubbed with the juice of the wild cotton until the globules are invisible; the arsenic is levigated, and the materials are beaten up together with the juice of the wild cotton to a proper consistence, and divided into six-grain pills, each pill containing one grain of arsenic. In two out of three of Dr. Russell's successful cases the Tanjore pill produced vomiting, in one purging also, and in one the operation was gentle by stool and perspiration only.—*Journal of Cutaneous Medicine, July* 1868, *p.* 223.

115.—NITROUS OXIDE AS AN ANÆSTHETIC.

By W. A. N. Cattlin, Esq., Brighton.

Repeated experiments upon the lower animals have strengthened my conviction that nitrous oxide is not so dangerous an agent as many have supposed it to be. Even with our present limited knowledge of its action, it will be found to possess some advantages over other anæsthetics for short surgical operations, and I shall be surprised if it does not ultimately prove less dangerous to life and health than chloroform, although I do not expect it will supersede chloroform or other anæsthetics for very protracted operations. I have seen it administered twice and thrice to the same patient, during very painful cases of tooth extraction, with the best possible effect.

Nitrous oxide (as your readers are aware) may be solidified. It has lately been exhibited by Dr. Evans, of Paris, in the liquid form in a bottle composed of aluminium bronze, but the intense degree of cold which is created when this fluid passes from the denser into the rarer state, coupled with other chemical disadvantages, leads me to think the gaseous form will always be most convenient for anæsthetic purposes.

Pure nitrous oxide may now be obtained (of Mr. Barth, 26, Duke-street, Bloomsbury-square) in small wrought-iron bottles containing fifteen gallons of compressed gas, which can be drawn off in any quantity for immediate use; therefore, the advantages of supply and portability have already been gained. It may easily be administered from an india-rubber bag with an elastic tube, which can be attached to the ordinary mouthpiece connected with the late Dr. Snow's chloroform-inhaler, or, what is better, through the very delicate bivalved mouthpiece invented and now used by Mr. Clover. For Hospital and Dispensary practice Mr. Alfred Coleman has invented a very ingenious instrument by which nitrous oxide may be deprived of carbonic acid when the same gas is inhaled by many patients. Thus far nitrous oxide has a fair start in the race which various anæsthetic agents are running, and it remains to be seen whether the researches which a committee of the Odontological Society are making to ascertain its properties will confirm or contradict the reports of individuals.

If this anæsthetic comes into general use (and I think it will be most valuable to dentists), it will probably be administered to patients in every imaginable condition. Latterly I have been endeavouring to ascertain the effect of nitrous oxide manufactured by persons unskilled in chemical science, and with this view I directed my female servant and gardener each to make some of the gas, while my son and myself also prepared some. Every sample was made from nitrate of ammonia, obtained from Messrs. Bell & Co., of Oxford-street, and in each case the gas was passed through solutions of protosulphate of iron and caustic potash. To test the action of the different samples, a glass jar capable of holding about four gallons of water was filled with nitrous oxide which had been made by my servant—it had been in a cylinder gasometer eight days, and in india-rubber bags one day. A guinea-pig was made to float under the jar upon a large bung which had been fitted to the size of the jar. It was very gradually affected, and fell down at the end of three minutes; at the expiration of five minutes it was removed, apparently dead and incapable of feeling. It recovered very slowly, and breathed with great difficulty for half an hour. A rabbit was then placed under the same jar, filled with fresh gas, which had only just been made under my own superintendence. It was more slowly influenced than the guinea-pig, fell down on the cork in five minutes, and was removed at the end of seven minutes. It recovered more slowly, but in the same manner as the guinea-pig had done. A fresh guinea-pig was now placed in some gas which had been made twenty-four hours before by my son. The animal was immediately affected, fell down in half a minute, rallied a little, then became insensible, and was removed from the jar at the end of five minutes. It recovered sensibility at the end of eight minutes, but breathed heavily for about half an hour. Some more of the same sample of gas was added, and a little air passed into the jar, when a rabbit was placed under it. The rabbit at once began to breathe with difficulty, fell in one minute, was removed in five minutes, and made the same kind of recovery as the former one. For the next experiment the jar was nearly filled with two samples of the gas, and some air passed in, when a strong cat was put under it. The cat gradually became stupefied, fell down at the end of three minutes, and was removed at the expiration of five minutes. In about five minutes afterwards it staggered into the house, ran into the cellar, and soon recovered.

A fresh rabbit was introduced into the same jar containing only atmospheric air. At the expiration of half an hour it seemed almost as lively as ever, and, our patience being exhausted, the animal was released. It will be seen by reference to my former experiments (Medical Times and Gazette, June 6) that various kinds of animals were affected more rapidly and recovered quickly when nitrous oxide obtained from Messrs. Bell & Co., of Oxford-street, was administered with inhalers made upon Snow's principle. I have merely detailed the facts as they occurred, and leave your readers to form their own conclusions.—*Medical Times and Gazette, July* 18, 1868, *p.* 78.

116.—BROMIDE AND BIBROMIDE OF MERCURY AS THERAPEUTIC AGENTS.

By Dr. Protheroe Smith, Physician to the Hospital for Women.

[Bromide and bibromide of mercury are precisely the analogues of calomel and corrosive sublimate in chemical composition. Therapeutically, however, it is impossible from the knowledge of the effects of one body to premise the action of its analogue. As, however, the relative amount of bromine to mercury in bromide of mercury is greater than that of chlorine to mercury in calomel, we may suppose that the aid of the former salt will play a more important part in its therapeutic effects than that of the latter in its similar action.]

Having been in the habit of prescribing the bromides of mercury during the past five years, and being impressed with their value as therapeutical

agents, I wish concisely to point out their general effects, in the hope of enlisting others in this investigation; so that, by long and continued observation, we may together accumulate such knowledge of their powers as may enable us more accurately to judge of their merits, as compared with those of the chlorides.

I have found, with the protobromide or subbromide, that a less dose than of calomel is required; that it acts more agreeably and effectually, both as a cholagogue and purgative, without the depressing results so often observed to follow the exhibition of calomel. It seems to be useful in promoting the absorption of hypertrophied glandular and other morbid tissue with less constitutional disturbance than the chlorides. I have administered it, with apparent great relief, in cases of biliary congestion of the liver, in chronic hepatitis with enlargement, and in those skin-diseases which yield best to the influence of mercury. I might quote some interesting cases of large anomalous tumours of the abdomen sensibly diminishing, and in two instances wholly disappearing, under the use of these remedies—viz., the protobromide of mercury in half-grain doses, and the perbromide in the form of an ointment of four grains to the ounce of cold cream; also of uterine tumefactions and morbid deposits around the cervix uteri and in the connective tissue of the pelvis, treated with pessaries of the perbromide, as well as the ointment externally. I could cite other instances of acute and chronic inflammatory disease in which the bromides have been apparently of great use; but my observations have been as yet so limited, and the difficulties of making perfectly correct observations on the action of a new remedy are so great, that I think it best to forego such means of proving its value till a mass of evidence can be adduced which may better test the accuracy of my conclusions.—*British Medical Journal, Oct.* 17, 1868, *p.* 422.

117.—PHOSPHORIC ACID IN THE TREATMENT OF DIABETES.

By Dr. J. G. Thornley, Newry, Ireland.

[The patient was a man twenty years of age, and his symptoms were those of a bad case of diabetes. He had been under treatment with bitter tonics, the use of bran bread and claret wine, but the improvement was trifling.]

I commenced treatment by giving grs. v. of pulv. Doveri three times a day; a full dose (grs. 2½) of opium every second or third night; 25 drops of dilute phosphoric acid in a glass of water thrice daily after meals, and 30 drops of tinct. ferri perchlorid. twice daily before meals. Jalap, podophyllin, scammony, and castor-oil, were each in turn administered as purgatives. Warm clothing, and entire abstinence from alcoholic liquids were enjoined. Weak beef-tea and mutton-broth were recommended as drink. Under this treatment the improvement became very marked: the urine became less in quantity and of lower specific gravity, so that he was obliged to rise only once during the night to pass water. The weakness became less, and thirst became considerably abated, but the appetite was not changed, it was still excessive, and craving. He became tired of taking medicine, and also of the monotonous diet, which consisted mainly of beef, bran bread and mutton-broth; he also gave up taking the Dover's powder and tinct. ferri perchlorid., trusting alone to the dilute phosphoric acid, which was now increased to 30, and ultimately to 35, drops for a dose, which latter had still the effect of keeping down the thirst.

As the appetite was still excessive creosote was tried in various combinations, but owing to its nauseous flavour the patient was unable to persevere in its use; it had therefore to be discontinued. Sulphate of zinc, tannic, and hydrocyanic acids were tried, but they proved valueless. Cod-liver oil was used for a considerable time, and it seemed to do good; it certainly improved the appearance of the patient. Alcoholic drinks of all kinds, even the claret wine, induced a state of feverishness, and invariably increased the thirst; they were therefore strictly forbidden. The patient himself has the greatest con-

fidence in the dilute phosphoric acid, and continues to take it to the neglect of every other remedy. It has so much improved him, that he now only drinks four pints during the day, and is seldom disturbed during the night, either by having to rise to drink or pass water. The appetite is somewhat, but not materially lessened; the skin is almost natural, and the bowels tolerably regular; the urine is greatly lessened in quantity, and of specific gravity 1039, ranging occasionally to 1042, and the strength strikingly improved. He has been able to follow his employment during the past six months, and is much more cheerful than formerly.

Now, I do not mean to say that phosphoric acid will cure cases of diabetes, but I believe that it is the principal, if not the only agent by which the thirst in diabetes can be materially lessened. I have observed its beneficial effects in two other cases, and I quite concur with the late Dr. Prout, who, I believe, was the first to introduce it to the notice of the profession, that it is of the utmost use in this inveterate disease. As to creosote, I cannot speak definitely, as owing to its disagreeable taste the patient was unable to continue its use sufficiently long. Tincture of perchloride of iron, Dover's powder, and opium, are valuable medicines in this disease, but any one of them used separately will not produce the same beneficial or striking effects of the phosphoric acid. As for tannic acid, sulphate of zinc, and hydrocyanic acid, I have never been able to discover their beneficial effects; but, on the contrary, I think the two former are productive of mischief by increasing the constipation. As for cod-liver oil I would recommend that it should get a fair trial in every case. Perseverance and self-control must be inculcated on every patient, without which success in treatment can never be attained.—*Medical Press and Circular, May* 20, 1868, *p.* 450.

118.—ANIMAL VACCINATION.

By Dr. William H. Stone, Port of Spain.

On my arrival, a few months back, in the island of Trinidad, West Indies, I found that amongst other functions with which I was temporarily invested were those of Vaccinator-General. The system of vaccination did not appear to be in a satisfactory condition; besides a considerable prejudice existing against its performance amongst the lower classes, the vaccine virus in use seemed feeble, uncertain in action, and liable to deteriorate rapidly.

It had been customary to keep up the standard of vaccine virus by frequent importations from England; but in my last communication with the National Vaccine Establishment I intimated a hope that I might find a local source of supply. This I have since been able to do successfully by the vaccination of cows in the Government pastures. Up to the present time the effect has been most decided; whereas the matter formerly in use produced small, scanty, and late pustules, I am now obtaining them large, abundant, and well-matured on the eighth day. The number of failures formerly bore a large ratio to the successes; but I have now vaccinated 112 cases in succession with two failures, one of which succeeded on revaccination.

The prejudice noticed above has, moreover, been materially diminished by this plan. It takes its origin in the widely spread fear of leprosy. This disorder, or rather, as I regard it, these two, if not three, distinct disorders, are unfortunately common here, and Creole minds are only slowly taking in the modern evidence of their non-contagious nature. If any contagion whatever exists, it must be admitted that inoculation would be very likely to develope it; and I have myself so far felt the reason of the objection that I have exhibited much more strictness in choosing cases from which to vaccinate than would be necessary elsewhere. But with matter direct from the cow there need be no fear whatever, as I am unaware of any disease kindred to leprosy having been observed in that animal.

The *modus operandi* was simple in the extreme. After isolating a fine young cow, I made several superficial incisions, or rather scratches, on the

soft skin between the udder and the teat, choosing a part free from hairs, and unaffected by the slight cracks which appear to attack this locality. Into these incisions I blew the contents of two or three capillary tubes recently filled from a successful vaccination, using purposely a larger quantity than would be required for the human subject. I performed two such inoculations, one on each side of the udder. The cow was then turned loose with the herd, which is of a mixed breed, between the Brahmin and European cattle.

On the sixth day the cow was again caught, and on examination, there was evident promise of success in the hardening and redness surrounding the punctures for about two inches. But no pustule was formed until the eighth day, when I removed the lymph in capillary tubes. It would, I believe, have been more abundant on the following day, as the pustules, about the size of a fourpenny-piece, of a brilliant nacreous white, with depressed centre, were still in the act of filling; but I preferred a smaller quantity of pure matter to the probability of a larger and less active yield. The cow evidently suffered from some local annoyance—was constantly licking the pustule, and showed decided signs of kicking when the matter was removed; otherwise she was and has continued healthy.

With the lymph thus obtained I proceeded to vaccinate the finest Portuguese and other white children I could lay hands on. The result, as above stated, was to be noticed immediately. Vaccinations performed with this lymph on the eighth day presented singularly large full vesicles, often the size of a threepenny piece, occasionally in other spots than in those of the puncture —for instance on the shoulder in one case, and on the face in another. The surrounding areola and constitutional disturbance were proportionally marked, but all the children did exceedingly well.

The lymph from these first vaccinations I distributed, as my duty is, to the various local vaccinators over the island. I understand that they have found the results equally satisfactory; very few demands were made for second supplies; and Dr. Kirkman Finlay, the resident surgeon to the San Fernando Hospital, one of the oldest and most scientific practitioners in the island, writes to me as follows:—"The results have been most satisfactory, without a single failure. Several cases presented in both arms a triple row of numerous pustules. This has never occurred to me before in vaccinating from imported lymph, and shows the great advantage derived from the practice you have introduced of procuring lymph in this colony."

The supply thus secured has been so abundant that, after satisfying the twenty-four district vaccinators, I have been able to spare a quantity for presentation to the Governor of Martinique, and am in course of forwarding other specimens to the Venezuelan Government.

As this topic has recently been mooted in the columns of the Lancet, the above may be worthy the attention of the profession. Besides its immediate practical bearing, the experiment shows the possibility of reinfecting the cow from human vaccine lymph, and *vice versâ;* and it goes far to establish the identity of symptoms and course in the disorder thus produced under very different climatic conditions from those which prevail in England.—*Lancet, May* 30, 1868, *p.* 684.

119.—A CASE OF SYPHILITIC ULCERATION OF THE THROAT TREATED WITH SULPHUROUS ACID.

By Dr. H. S. Purdon, Physician to the Belfast Dispensary for Diseases of the Skin, &c.

We are indebted to Dr. Dewar, of Kircaldy, and Mr. Pairman, of Biggar, for bringing more prominently under the notice of the profession the various uses of sulphurous acid as a therapeutic agent; and several cases have been recorded in the medical journals in which this remedy has effected speedy cures. The following case, I think, testifies to its value.

Mr. Robert W., aged 30 years, consulted me on August 17th, 1867, for a hard chancre of a few days' duration, situated at the corona glandis, which I

touched with strong nitric acid, and prescribed a "blackwash" as a local application, with the green iodide of mercury internally. Under this treatment, he was apparently cured, and I lost sight of him till the following November. I may mention, he told me that about four years previously he contracted a chancre, and which was quickly followed by a bubo. The medical man he then consulted prescribed "Plummer's pill," and which occasioned profuse salivation. I again saw him in November, and found that he was labouring under a syphilitic affection of the throat, both tonsils and part of the pharynx being covered with an ash-coloured slough; he experienced great difficulty in swallowing, appetite bad, passed sleepless nights, and was extremely anxious about his present state of health; no cutaneous eruption visible. For upwards of eight weeks various remedies were tried, viz., iodide of potassium, in ten grain doses three times a day, the bichloride and biniodide of mercury, gargles of chlorate of potass and alum, and solution of the nitrate of silver, twenty grains to the ounce, with opium at night to procure sleep. This treatment only checked the spread of the disease, which remained in *statu quo* till the middle of January, when I happened to see recorded in the Lancet for October, 1867, a case in which a patient of the London Hospital was treated for syphilitic ulceration of the throat by the application of sulphurous acid spray. I thought Mr. W.'s case likely to benefit by the same treatment, and commenced using the spray to the affected part three times daily on January 25th inst. At first I applied it for a short time only, but finding that it gave no pain, the end of the instrument was brought nearly in contact with the part affected, and the application of the spray continued for several minutes each time. On Saturday, February 15th, the throat was perfectly well, and there has not been any return of the disease since.

I have at the present time under treatment a gentleman suffering from a syphilitic affection of the tongue, in which I am applying the sulphurous acid spray with the best results.—*British Medical Journal, May* 9, 1868, *p.* 447.

120.—ON THE THERAPEUTICAL ACTION OF DIGITALIS.

By Dr. Edward Mackey, Joint Professor of Materia Medica in Queen's College, Birmingham.

[The great question of the day in therapeutics, is undoubtedly the action of digitalis on the heart. The author's experience of the remedy is the same as that of most recent writers on the subject, viz., that it has the power of strengthening and making regular a feebly acting heart. In support of this he offers the following clinical experience.]

Case 1.—(Dr. Handfield Jones, Medical Times and Gazette, December, 1862.) Male, aged 65. He was anasarcous; dyspnœa was so great, that he could not lie down; the heart-sounds were weak, the impulse diffused, the area of dulness increased; no evident murmur; no arcus senilis; no albumen in urine. On February 22nd he began to take ten minims of tincture of digitalis with ten minims of tincture of sesquichloride of iron and chloric ether. On February 25th he was reported better; no panting; pulse and heart's action stronger and firmer. No doubt the rest in hospital helped to this improvement; but on April 2nd he had relapsed since the digitalis had been omitted for ten days and cinchona substituted; whereas "on the 6th of April he was improved again, digitalis having been resumed in about five-drachm doses of infusion." The drug was given then, "when the heart's action was certainly failing, with the effect of strengthening that action."

In the same paper Dr. Jones reports a case of "dilatation and enfeeblement of heart; no better case could be imagined to test the influence of digitalis, and the result was unequivocal. Instead of causing any further depression of the enfeebled organ, it decidedly increased its tone and power, and that more than any other remedy given."

Case 2.—(Dr. Stirling, Medical Times and Gazette, March, 1864.) Mrs. F., aged 69, for six years had had occasional attacks of dyspnœa, with irregular heart's action. In March, 1862, a severe attack came on suddenly. Soon after

wards there set in congestion of the lungs, cough with hæmoptysis, œdema and ascites; the pulse at the wrist was almost imperceptible, and the action of the heart tumultuous, without *bruit*. In spite of stimulants, diuretics, and counter-irritation, the case seemed hopeless, when ten drops of tincture of digitalis were prescribed every four hours; and "from a state of agony she enjoyed comparative quiet in less than three days; the heart's action became daily stronger, as indicated by less tumultuous movement, and by slower pulse."

Two other and analogous cases are reported by Dr. Stirling in the same communication. A somewhat similar case, but complicated with valvular disease, is recorded by Dr. Murray (Medical Times and Gazette, March, 1865).

Case 3.—J. K., aged 56, was admitted into the General Hospital, Birmingham, under Dr. Russell, March 24th, 1865. There was no history of rheumatism, but of a severe fall and striking the chest against a wagon forty years previously; also of winter-cough and dyspnœa for twenty years. He was strongly built, but his muscles were now flabby; the face was pale, and the venous circulation embarrassed. The legs were anasarcous; the heart's impulse was very feeble; the sounds were scarcely to be heard; there was no *bruit:* the pulse was so fluttering as to be uncountable; respiration 22, regular, but at times much hurried; he had much cough; there was dulness over the base of the lungs, and over a larger than normal cardiac area.

March 26th. He was ordered to take three times a day five minims of tincture of digitalis with ether and ammonia.

March 28th. The pulse was rather stronger, but still too fluttering to be counted; the sounds of the heart could not be distinguished from each other; the urine was scanty, loaded with lithates. He was ordered to increase the tincture of digitalis to nine minims, to have a colocynth aperient, two glasses of gin, and to have his legs punctured.

March 30th. The legs were discharging; the bowels were free; the urine was scanty; dyspnœa was urgent at times. He was ordered an extra glass of gin, and one-eighth of a grain of morphia every four or six hours. (The administration of morphia in heart-disease is made a special point in Dr. Russell's practice; in the present instance it is considered to have assisted the action of digitalis). This was continued; and on the following day (April 1st) he was greatly improved; breathing easier; pulse 100, regular; he passed last night 238 ounces of urine in twelve hours; the morphia did not cause sleep.

April 4th. He continued better; pulse 90, regular; his breathing was quieter, though he could not lie down; the anasarca was much less; he passed 96 ounces of urine in the last twelve hours.

April 6th. The impulse of the heart was diffused, abrupt, heaving; the dulness was almost obliterated; the sounds were exceedingly feeble, especially the second. He was ordered twelve minims of tincture of digitalis with ten minims of tincture of sesquichloride of iron three times a day.

April 11th. Breathing was easy; he could lie down; the œdema was nearly gone; the change for the better was most striking. He passed 84 ounces of urine in twelve hours.

Let me add briefly these "opinions." Dr. Gull (Medical Times and Gazette, July 29th, 1865) observes: "I look upon it as a fact, which clinical experience has clearly and definitely settled in my own mind, that digitalis is capable of diminishing the frequency of the heart's beat, and of increasing the power of the heart's impulse; and is especially useful in cases of disease of the left side, in which the action of the organ is very rapid and feeble."

Dr. Wilks (same reference) remarks of a case of "dilated enfeebled heart," that "this was just one of those cases in which digitalis might be expected to do good;" and relates an example of it.

Dr. Fuller says: "During many years I have observed that the cases of heart-disease most benefited by digitalis have been those in which the heart has been weak and dilated, and pulse feeble and irregular."

Granted, then, that digitalis is indicated in the conditions alluded to, let

us examine whether any complications likely to be present will contraindicate it.

(*a.*) Will a state of fatty degeneration do so? If far advanced, it certainly will; for its subject will be liable to sudden death, which the action of digitalis may hasten. Some illustrative cases and opinions are recorded in the Medical Times and Gazette, July 1865. This is one of the most difficult points to consider with regard to the administration of the drug; for doubtless many weak hearts are weak because they are fatty; and, if this condition is to prohibit digitalis, how can it be said to be useful in weak heart? Moreover, it is difficult to ascertain how far the degeneration has advanced, though we may be sure of its presence. (See Dr. Stokes; and Kennedy on Fatty Heart. Edinburgh Medical Journal, 1859, part i.) But this suggested caution and difficulty are not greater or more unusual than with some other powerful drugs, and do not invalidate the conclusion derived from the above series of cases; only they call for this rule in a dubious case: commence with a small dose (five minims), better combined with an ether; watch carefully; increase gradually; and stop occasionally.

(*b.*) Will mitral regurgitation contraindicate digitalis? No, it will not; and this is generally—though by no means universally—acknowledged. An interesting case, illustrative of the value of the remedy in this form of disease, has been kindly forwarded to me by Dr. Keyworth.

Case 4.—"J. C., aged 62, in 1866, passed fragments of lithic acid calculi. In June 1867, his urine became scanty, and contained blood, and his legs became œdematous. He began to have much dyspnœa, and palpitation, and was found to have a systolic *bruit*, more distinct at the apex of the heart. In the following December, the ascites and anasarca were so great that he could not walk; and his breathing was so distressed that he could not lie down. He had continued cough with scanty expectoration, which often contained blood. In the interval he had taken at various times, and with slight benefit, tincture of perchloride of iron, squills and ether, acetate of potass, broom, and digitalis in small doses, elaterium and gamboge, quinine and acids. On 19th December he had been taking acetate of potass with spirit of sulphuric ether and tincture of opium, which mixture relieved his breathing a very little. Then I began to give him, in addition, digitalis upon the plan suggested by Dr. Mackey (in a paper which I read about that time); viz., half-drachm doses night and morning, in a little water. His girth was then forty-six inches and a half. By January 15th, 1868, he had diminished to thirty-five inches. His urine had become gradually clearer, and less albuminous, often nearly free from blood. He continued the medicine up to the end of March, by which time the ascites was removed, and he could walk about the house and eat and sleep well. He can now (May) walk three or four miles, and, though he has occasionally œdema of the ankles, he is practically convalescent."

The effect of the remedy on the pulse was to increase its strength, to diminish its frequency, and to make it less intermittent.

(*c.*) Will mitral obstruction contraindicate digitalis? No; it will not.

Case 5.—M. M., aged 40, had history of heart-disease for 17 years. She had had rheumatic fever twice, and bronchitis at intervals. In October 1865, the heart's action was irregular, tumultuous, and painful; the sounds were not clear; over the aortic valves there was marked roughness with the first sound, scarcely a *bruit;* when the heart was quieter a presystolic *bruit* could be distinguished, of which one could say, that it was, *perhaps*, more distinct at the apex; the radial pulse 60-64, visible, weak. She had giddiness; had never had epistaxis; the liver was congested; the urine was scanty; the extremities œdematous. I prescribed one grain of powdered digitalis, with two of mercury and squill, to be taken night and morning, and a saline diuretic three times a day. After the third pill, there was slight soreness of the gums, and copious diuresis began. Within a week she felt better than she had done for many years, and was able to walk without much difficulty of breathing. She then took one pill daily, and then on alternate days, and the improvement continued for many weeks. Later on she relapsed, to be again

relieved by the same remedy; but, in the summer of 1866, she was found dead in bed (she had not been under treatment for many weeks); and Mr. Denny, who examined the body, informed me that the prominent morbid condition was an extreme ossification of the mitral valves.

(*d.*) Will aortic regurgitation contraindicate digitalis? I so far believe that it will, that I have never thought it prudent to treat that disease with the drug; and I am satisfied that the majority of the profession think similarly, —impressed, no doubt, by the strong language of Sir D. Corrigan (Edinburgh Medical and Surgical Journal, vol. 37, 1832):—"In every case of this disease in which digitalis has been administered, it has invariably aggravated the patient's sufferings." I have examined a large number of hospital reports of cases of aortic regurgitation, without being able to add definite facts to our knowledge upon this subject; but I was anxious to do so, because I am sensible of some contradiction to facts previously recorded indicative of a tonic action of digitalis. If the drug be regarded, as no doubt Sir D. Corrigan regarded it, as a sedative and depressant (he does not mention the dose given), one would fairly expect that it should injure a patient with compensatory hypertrophy in the disease under consideration; but, if the drug be regarded as a tonic to the heart, then surely it ought to relieve. A heart with aortic regurgitation is improved by strengthening measures of all kinds; either then digitalis (in small doses) ought to improve its condition, or it is no tonic.

I would answer, either that the decision against the remedy in this disease is formed from the action of too large doses, and that the question deserves reconsideration; or that the remedy acts as a tonic under certain circumstances, but not precisely under these—which would be a fact not unusual in the action of tonic remedies; or, again, that granting a state of compensatory hypertrophy or dilatation of heart, in cases of aortic regurgitation, the very slowing of the heart's action may explain injurious effects, though the slowing be not necessarily from impaired power.

(*e.*) However this may be, I am sure that this remedy may be most useful in aortic *obstructive* disease; and such, I believe, are the cases which I often find alluded to in reports, published and otherwise, as "aortic disease benefited by digitalis." There has not been sufficient accuracy in distinguishing between even the two marked varieties of aortic disease—the regurgitant and the obstructive: in the former, I am content at present to believe digitalis hurtful; in the latter, I have a good deal of clinical evidence to prove its use. Space, however, allows me to insert only one illustrative case, for which I have to thank Dr. Russell.

Case 6.—A. W., aged 20, had acute rheumatism two years ago. After some months of failing health, dyspnœa, and dropsy, she was admitted into the General Hospital, Birmingham, on Oct. 14th, 1864. She was anæmic and emaciated; could not lie down because of sense of suffocation. Pulse 100; respiration 24. There was some anasarca. There was no albumen in the urine. For the first week she took little but wine. October 23rd. There was strong impulse of the heart over the whole left side of the chest, and distinct pulsation of the carotids. Pulse 108, exceedingly small. There was loud, shrill bellows-sound preceding the heart's impulse, at the apex (mitral). After improvement under remedies there was also a systolic *bruit* over the aortic valves, propagated up to aorta; and this, I consider, we may fairly take as evidence of aortic obstruction. The pulmonary sounds were clear.

October 25th. Pulse 108; respiration 32. She could not lie down. She was ordered four minims of tincture of digitalis, with ether, every four hours.

October 29th. Pulse 116; respiration 30. She appeared much relieved, and passed twenty-four ounces of urine in twenty hours. The tincture of digitalis was increased to nine minims.

November 1st. . She was able to lie down lower, and was better. The urine was not increased. She was ordered to take fifteen minims of tincture of digitalis three times a day.

November 3rd. Pulse 100; respiration 22. The urine in forty-eight hours was forty ounces. She felt much better, and could lie down.

November 8th. The action of the heart was much quieter. Pulse 100; still very feeble; urine forty-eight ounces in forty-eight hours.

November 12th. She could walk about. She was ordered to take citrate of iron, and omit the digitalis.

December 6th. She left, much improved.

(*f.*) Will hypertrophy of the heart contraindicate digitalis? That will depend upon its cause, which will either be one of cardiac conditions already referred to, and which will, of course, guide the decision, or obstruction to the pulmonary circulation, or uræmia, which diseases do *not* by any means contraindicate this remedy. I have not met, nor do I expect to meet, with a case of uncomplicated hypertrophy; but such a condition affecting the left ventricle is reported (Medical Times and Gazette, March, 1865), in which "digitalis was fairly and carefully tried, and aggravated the symptoms." Dilatation, also, is a secondary disease, and its treatment must be guided by its cause. In itself, it is likely rather to lead one to expect benefit from digitalis than to contraindicate it.

(*g.*) Is the drug likely to benefit functional disorder, palpitation, &c.? Not at all, as far as I know or can learn.

I proceed to inquire what preparation and dose will be suitable for a given case in which we may have decided that the drug is desirable. I find digitaline still rather distrusted in English practice, and teaching and custom in favour of the use of the tincture when any special effect on the heart is desired, and of the infusion when a diuretic action is wanted. The objection to the two former preparations is their uncertainty of strength or of operation, to the latter its tendency to nauseate. For general use, I have myself found the tincture the most reliable; but, if one is to depend upon it, great care must be taken in selection and keeping of the leaves. It is remarkable how independent sometimes are the cardiac and diuretic actions of the drug (Conf. Christison, Edinburgh Medical Journal, vol. xx. 1855; and Munk, Guy's Hospital Reports, 1844). As to the dose, it will be better, in any case when the heart's action is very feeble, to commence with five or ten minims of the tincture every four or six hours. I have seen it in such cases rapidly increased to fifteen, twenty, and thirty minims, and with benefit; but, as a general rule, such a dose as thirty minims is often enough, repeated twice in the twenty-four hours. An equivalent dose (practically) I consider to be one tablespoonful of fresh infusion, or one grain of the powder: but a patient taking such a dose should be kept recumbent, at least for half an hour before and for two hours after. I should hesitate before prescribing a larger dose than fifteen minims of the tincture to any patient following his occupation. There is no doubt about the fact that a dose of half a drachm of the tincture repeated several times at short intervals, especially in the upright position, *may* produce dangerous interference with the circulation, whether it be from over-stimulus (Jones) or from a partial paresis—a tonic action. But, given as I have described, I have found no untoward results of "cumulative action" (Conf. Dr. Fleming, Edinburgh Medical Journal, December, 1862). I can well believe that the drug is given less frequently and more carefully than it was thirty years ago. We must by no means ignore its external application. It is rather common in France. I find it praised by Christison (Edinburgh Medical Journal, 1850); and more recently, we have valuable testimony in favour of poultices of the fresh leaves (Med. Times and Gazette, January 25, 1868, Dr. Brown). The application of a strong decoction (two ounces of the leaves to a quart of water boiled to a pint) with lint and oil-silk has been of use; but I have found more satisfaction from a compound liniment of equal parts of tincture of digitalis, tincture of squills, and soap liniment.

Case 7.—H. N., aged 10, had slight general anasarca after mild scarlatina. The urine was of specific gravity 1,010, pale; one-eighth of the volume was albumen, blood-corpuscles, and fibrinous casts. He was ordered fifteen grains of compound jalap powder; and three grains of potassio-tartrate of iron with five grains of bitartrate of potash three times a day. Three days afterwards he seemed better, but sudden and general increase in the dropsy took place: the breathing became hurried, the lips discoloured; the child became drowsy,

and vomited; he passed very little urine for thirty-six hours. Then I saw him again, and applied immediately linseed poultices to the loins, the liniment over the kidneys, and gave him two drops of the tincture of digitalis in combination with one grain of iodide of potassium and three grains of bitartrate of potash every four hours. Within an hour he passed urine, and within twelve hours two pints; and from this time forward he progressed uninterruptedly.

Case 8.—W. H., aged 2, had mild scarlatina. At the end of twelve days, general dropsy began, and in forty-eight hours was already so great as to threaten life. There was constant cough, and dulness at the base of both lungs. He has passed very little urine lately. I began the liniment, a mixture similar to the last, with tincture of squills and a jalap powder—all the remedies at once—about 8 p. m. Within an hour the child passed urine freely; and before morning he had excreted a pint and a half, and was relieved. He eventually recovered.

In connexion with the preceding and subsequent observations, it is desirable to notice an interesting theory that has been advanced to explain the action of digitalis; viz., that it acts primarily on the sympathetic (vaso-motor) system of nerves; that it stimulates the said system, and so causes increase in the contractile power of the capillary vessels. The theory has been well put lately by Legroux (*Du digitale*, Paris, 1867), and supported by reasoning somewhat as follows.

1. M. Galan has *proved* (Thesis, 1862) that digitalis, administered to frogs, will cause contraction of the capillaries of the web.

2. M. Legroux has *seen* the subcutaneous injection of digitaline (one *centigramme*) cause long continued contraction of the central artery of a rabbit's ear.

3. In certain conditions wherein the sympathetic is paralysed (partially), digitalis will act as known stimuli to it will. I will consider this point more in detail.

What are the effects of paralysis of a sympathetic branch? If it be complete, as after division of the nerve, there will be dilatation of the capillaries of the part supplied by it, increase of heat, congestion, perhaps effusion, &c. If it be partial—that is, if the nerve be doing duty in a feeble manner, as in patients suffering from fever, from debility after hemorrhage, or from chronic illness—there will occur similar accidents, though in a less degree; the normal balance of circulation will be interfered with; the heat of the body will be increased; the secretions will be altered; there will be partial congestion, as in the extremities; the vessels will be relaxed; arterial tension will be diminished; and the heart's action will be feeble, rapid, and irregular.

Now these effects may be controlled, and even obviated for a time, by a stimulus applied to the same system. Galvanising the distal end of the divided nerve will re-establish normal circulation; and a powerful emotion *may* re-establish apparent health for an hour or two in a feeble invalid. Now, taking the condition of the capillaries to indicate the state of the sympathetic—their relaxation to indicate a partially paralysed, and their contraction a tonic state of it—it is to be proved that digitalis has power to induce the latter.

In the first place, says M. Legroux, it will, when given to persons in feeble health, *increase* arterial tension, as proved by sphygmographic trace (*op. cit.*, p. 46): therefore it must increase the contractile power of the capillaries, the principal indicators and rulers of the said tension.

In the second place, it will lower the temperature of the person taking it, sometimes even *before* the heart action be slowed (Wunderlich and others, quoted at p. 70): therefore its primary effect is not on the heart, but on the capillaries; and it is to contract them.

In the third place, it will diminish the frequency of the heart-beats, and yet it will, in equal proportion, increase arterial tension (Marey); we conclude, then, that the heart is not weakened, but is slowed secondarily to the contraction of the capillaries. This slowing does not occur till twelve, twenty-four, thirty-six hours after administration of a moderate dose; more-

over, it is often preceded by a quickening. This latter fact is to be explained as a consequence of increased effort required to overcome the resistance of the narrowed capillaries to which the heart was not accustomed (*sic*).

In the fourth place, it will relieve local congestion; and of this clinical experience will give us proofs. It has been of service in pneumonia (Lissauer, Thesis, Berlin, 1856); in uterine and pulmonary hemorrhage; and markedly in hemorrhoids. This last disorder is a good instance in point, because cure may be produced without notable effect on the heart; and, as this is not generally known, I will insert here a few cases, kindly forwarded to me by Mr. Duncalfe, who drew attention to this subject in 1859.

Case 9.—April, 1859. T. W., aged 45, had drank freely, but not lately. He had had piles occasionally for many years, more persistently for the last two. With each motion now he passed a little blood and much mucus. On examination, no external pile was found. The sphincter, when pressed upon firmly, gave the sensation of a hard swelling underneath. On straining, there was protruded a dark bluish pile, which was painful to the touch. The sphincter was firmly contracted, and admitted the finger with some difficulty and with much pain. Two or three painful protrusions were felt within the rectum; and much heavy throbbing pain was felt after withdrawing the finger. He was ordered tincture of digitalis, in ten-drop doses, every three hours during the day. After two days' trial, he said, "he had not had so much ease for months." The sphincter was less irritable. There was some mucus, but no blood. He was ordered to take one teaspoonful of castor-oil in milk every morning, and to continue the digitalis. Five days after the first administration, "passes no blood, no mucus, and is free from pain." Since the report, he has been under treatment on three separate occasions for piles—the result, no doubt, of irregular living. Relief and cure have, on each occasion, followed the use of digitalis.

Case 10.—June 1859. N. S., aged 40, stout, plethoric, had had piles for several months. He had taken different remedies, without more than temporary relief. He passed very large quantities of blood after each evacuation, and suffered much from tenesmus and pain up the sacrum. Externally, three piles, one of the size of a horsebean, and two about as large as peas, were observed. The sphincter was firmly contracted. The piles were returned within the rectum, but gave rise to much pain and desire to defæcate. Fifteen-drop doses of tincture of digitalis were ordered to be taken every three hours. On the second day after taking the medicine, he had no more bleeding, no pain; said he was well. He continued the medicine in smaller doses for two or three days, and at the end of a fortnight, had had no return. Three months afterwards, he had signs of relapse after hard lifting. He immediately applied for his medicine, which was given to him; and he was not troubled afterwards.

Case 11.—1867. E. C., aged 48, a strong man, accustomed to walk much, had had piles for years. He had them tied once. The sphincter was loose, easily yielding to the protrusion of large congested piles. He lost blood with each motion. He could scarcely take exercise, owing to the faintness produced by dragging pains. His health had been failing lately. The skin was loose and perspiring; the complexion haggard; tongue pale and tremulous. He was ordered fifteen minims of tincture of perchloride of iron, with ten minims of tincture of digitalis, every four hours. When the medicine had been continued for a week, he was better, and could walk longer without the piles coming down. After continuing the medicine for three weeks, he could walk without inconvenience for five or six miles.

His health, however, was much below his standard. He went to the seaside, and returned home well. He had had no inconvenience from piles since he left home.

Case 12.—1868. A. F., mother of seven children, had been subject to piles during gestation and after delivery of her last three children. Previous treatment never relieved her. One week after her last delivery, she was found to have a large protrusion of piles and mucous membrane external to the sphincter, tender, and producing much uneasiness. Digitalis was given

in fifteen-drop doses, combined with five grains of extract of henbane. The bowels were relieved by enemata. In two days, the piles could be returned within the sphincter, and protruded only after defæcation. The treatment was continued for a week, and then the tumours were less vascular and smaller, scarcely tender, and could be readily returned without pain. There was, however, much redundant mucous membrane; and the piles were touched with the strong nitric acid, with the usual precautions. In three weeks' time she was well. She has since borne another child, and the piles were not so bad as to require treatment. I ought to add to these cases, that I have myself found some good effect from its use in hemorrhoids, but not much in cases with marked constitutional disorder, hepatic, or otherwise.—*British Medical Journal, May* 30 *and July* 11, 1868, *pp.* 529, 27.

SYNOPSIS,

CONTAINING A SHORT ABSTRACT OF THE MOST PRACTICAL ARTICLES IN THIS VOLUME: SHOWING, AT A GLANCE, THE MOST IMPORTANT INDICATIONS OF TREATMENT PUBLISHED BY DIFFERENT WRITERS WITHIN THE HALF-YEAR; INCLUDING SEVERAL PAPERS NOT INSERTED IN THE BODY OF THE WORK. (ARRANGED ALPHABETICALLY.)

AFFECTIONS OF THE SYSTEM GENERALLY.

ACUTE RHEUMATISM.—*Valerian.*—Valerian administered in the form of a bath is of extraordinary efficacy in subduing the pain of inflammation attending acute rheumatism. The bath is made simply by taking ℔j. of valerian root, boiling it gently for about a quarter of an hour in one gallon of water, straining it, and adding the strained liquid to about twenty gallons of water in an ordinary bath. (Dr. N. J. Butler, p. 28.)

CANCER.—*Chloride of Zinc.*—A ready means of applying chloride of zinc in cases of cancerous or other sores, is to soak lint in the liquid produced by the deliquescence of chloride of zinc, aided by the addition of a few drops of water. It should then be hung up to dry as much as possible, and kept for use in a pasteboard box. The great convenience of the chloride of zinc lint is that the smallest piece may be used, even to a wart or pimple, or to parts, such as the eyelids, to which it would be almost impossible to apply the old paste. (Mr. W. Cooke, p. 30.)

Caustic Arrows and Carbolic Acid.—Two cases of cancer are related which were completely removed as follows: Punctures were made deeply round the tumours, by means of a broad lance, and into these caustic arrows were inserted. No pain or irritation resulted, and the tumours came away in three days, leaving a grey-coloured slough, which was detached in twenty-four hours more, by means of a linseed-meal poultice. The surface exposed was painted freely with carbolic acid, and the whole covered by wadding dipped in glycerine. It is singular that this treatment is quite painless. (Dr. J. R. Wolfe, p. 29.)

Relief of Pain in Open Cancer.—At the Middlesex Hospital the following ointment is used with considerable success for the relief of pain in open cancer. The formula is from the hospital pharmacopœia:—Half a pound of fresh stramonium leaves, and two pounds of lard; mix the bruised leaves with the lard, and expose to a mild heat until the leaves become friable, and then strain through lint. The ointment is to be spread on lint, and the dressing changed three times a day. (p. 31.)

FUNGUS THEORY OF DISEASE.—This theory is disputed by the author, who has discovered what he calls "sulphate of sepsin" in putrefying materials, which he thinks represents the poison of organic substances undergoing fermentation, and which may be diffused through the air. He has obtained this substance by a process described, and can produce highly poisonous effects on animals. (Dr. Bergmann, p. 19.)

AFFECTIONS OF THE NERVOUS SYSTEM.

CHOREA.—*Calabar Bean.*—The action of physostigma, or Calabar bean, is that of a direct sedative to the reflex excitability of the spinal cord. It

may hence prove a remedy of value in the treatment of chorea. From three to six grains of powder, thrice or four times daily, may be given to children; and from ten to twenty grains, as frequently to adults. It has been used in several cases with apparent success. (Dr. T. R. Frazer, p. 58.)

COMPRESSION OF THE BRAIN.—When compression of the brain occurs from rupture of a meningeal artery, the result of accident, the less we rely upon the symptoms and the more upon the history of the case the better. The symptoms of compression are not present at first; the patient is merely confused, and when more urgent conditions supervene he dies very quickly. It is to the interval of immunity between the accident and the occurrence of symptoms, that we must almost exclusively give attention if we wish to diagnose these cases. The symptoms preceding death are not those generally given by writers as indicating compression. The patient, it is true, becomes insensible; but he is pale, with dilated pupils, a rapid, feeble pulse, and irregular respiration. The "stertor" is only present at times, and the pulse is far from "laboured." When the blood is *under* the dura mater the symptoms of severe concussion are present from the first. The bleeding usually takes place from many small vessels, and hence it ceases short of the results which a ruptured middle meningeal will produce. The patient may therefore live much longer, remaining throughout insensible, and with the stertor, laboured pulse, and flushed face, formerly held to be universal in compression. (Mr. J. Hutchinson, p. 44.)

DELIRIUM TREMENS.—Do not set out in the treatment of delirium tremens with the idea that sleep must be produced at all hazards, as soon as possible, by means of opiates. You run a risk of causing the patient's last sleep of all. Rather place him in bed, in a small quiet room, with one or two attendants, and he will frequently fall asleep without any opiate at all. It is rare, however, that sleep occurs before the third day. After that time opiates may be given, and no form is better, perhaps, than the old prescription of twenty drops of antimony wine with twenty drops of laudanum every four hours, keeping up the patient's strength with beef-tea. The idea is erroneous that the disease occurs owing to withdrawal of the accustomed stimulant. We must look upon the attack as the effect of excitement acting upon a previously weakened brain. It does not always do to continue the antimony long. As a rule it is better to give no stimulant, but in some occasional cases a glass of wine or beer in the form of nourishment is required. (Dr. S. Wilks, p. 48.)

EPILEPSY.—The loss of consciousness and the convulsions of epilepsy are the result of sudden and extreme anæmia of the brain. A number of facts point to this conclusion, such as that convulsions always precede death from rapid hemorrhage. When this anæmia is not caused by hemorrhage, or by a mechanical impediment in the circulation, the proximate cause is extreme contraction of the minute cerebral arteries. All cases may be divided into two distinct classes: 1, cases in which the arterial contraction is the result of a purely nervous or reflex influence; 2, cases in which the arterial spasm is a result of blood-poisoning. In the first class are included cases due to terror, anger, anxiety, vicious sensual habits, dentition, calculus, worms, organic diseases of the brain, and hereditary causes. In the second class are included cases due to uræmic poisoning, alcoholism, the presence in the blood of fever-poison, especially that of the exanthemata, as small-pox. (Dr. G. Johnson, p. 61.)

HEADACHE.—*Bisulphide of Carbon.*—Pour a small quantity of bisulphide of carbon on some cotton-wool contained in a small wide-mouthed glass stoppered bottle. The mouth of the bottle should be applied close to the temple, or behind the ear, as near as possible to the seat of pain, and so held five or six minutes. The effect is generally rapid. (The late Dr. G. Kennion, p. 72.)

Chloroform.—A correspondent of the British Medical Journal says that he has found chloroform (applied in the same manner as Dr. Kennion used bisulphide of carbon) very useful in similar cases. In those cases of hemicrania which depend on gastric derangement, eight or ten minims of chloroform given internally will materially assist. (G. F. E. p. 72.)

LOCAL PAIN.—*Subcutaneous Injection of Atropine.*—Atropine is a valuable

remedy for the relief of local pain and spasm. It should be injected under the skin in a dose of $\frac{1}{100}$ of a grain of the sulphate as a commencing dose. It should be cautiously increased to $\frac{1}{60}$ or $\frac{1}{80}$ grain; more can seldom be needed, and very uncomfortable poisonous effects may easily be produced if it be pushed to higher doses. It is less frequently tolerated than morphia; but it is an interesting and valuable fact, that persons who are quite unable to bear morphia will often bear atropine, and *vice versa*. Atropine is incomparably the best of all medicinal remedies for every kind of pain in the abdominal viscera. (Dr. F. E. Anstie, p. 261.)

NEURALGIA.—*Ergot of Rye.*—Ergot of rye is a remedy of great value in some cases of neuralgia, probably owing to its influence upon the sympathetic nerves, through the medium of which it restores the suspended tone of the remote arterial circulation. (Dr. E. Woakes, p. 66.)

Aconite and Quinine.—The effect of aconite in combination with quinine is valuable in the treatment of neuralgia, and this in cases in which quinine would have no effect if taken by itself. The case given illustrating this action is worth purusal. (Dr. H. M. Jones, p. 69.)

Hypodermic Injection of Morphia.—The permanence of the relief to neuralgia afforded by subcutaneous injection of morphia is infinitely greater than when the remedy is given by the mouth. Affections of this kind, which under any of the older plans of treatment would at least have been very tedious, are sometimes cured after three or four injections of one-sixth of a grain each; and very many yield after a week or ten days of such injections, repeated twice daiiy. It is moreover certainly the fact that there is far less tendency with hypodermic than with gastric medication to rapid and large increase of the dose, when morphia is used for a long time together. Dr. F. E. Anstie, p. 261.)

PARALYSIS.—*Faradisation.*—The broad rule for the application of faradisation, or the induced current, in the treatment of paralyzed muscles is this:—When the electro-motility is diminished or exhausted, faradisation will be of service; when the electro-motility is unaffected, as it is in most cases of cerebral origin, it will not prove of any use. The question then, of the use or *not* of faradisation in a given case of paralysis involves a primary question of diagnosis. There are certain forms of *quasi*-paralysis in which the electro-motility is intact, in which faradisation is of much benefit. These are the so-called wasting palsy and local atrophy of muscles. In these cases, the paralysis of movement depends upon the loss of muscular tissue, that which remains acting normally under the faradic current, and as a rule responding to the volition. (Mr. J. N. Radcliffe, p. 51.)

Paralysis with Wasting of Muscles in Children.—In this disease which has been generally known as "essential paralysis of children," M. Laborde has shown that there is a distinct change in certain portions of the spinal cord; that the anterior columns are more translucent than natural, and of a greyish rose-tint; and microscopic observation shows changes in their minute structures. The treatment which has been found the most efficacious has been the judicious use of electricity, and it often happens that the recovery is complete, and this after several years duration of the paralysis. The most efficacious application is that of the interrupted battery current. It sometimes happens that although galvanism is useful at first, the muscles cease to respond to it, and that they then contract readily when faradisation, the induced current, is applied. (Dr. J. R. Reynolds, p. 39.)

TETANUS.—*Atropia.*—In a case of tetanus the $\frac{1}{60}$ of a grain of atropia was given every three hours. "Within twenty-four hours the physiological action of atropia showed itself; then the clonic spasms became less severe, and of shorter duration; and the tonic rigidity gave way, first in the legs and neck, then in back, and last of all in the abdomen and masseters. On the sixth day of treatment by atropia, rigidity of the masseters alone remained." (Dr. G. Oliver, p. 54.)

Calabar Bean.—The most successful treatment of tetanus must be by the employment of such means as remove, or oppose, the condition of exaggerated reflex sensibility in which the disease consists. Neither opium,

aconite, belladonna, tobacco, nor curare, all of which have been employed in the disease with a certain amount of success, possess the real thing required, a primary and energetic sedative action on the reflex activity of the spinal cord. Physostigma (Calabar bean) has precisely this action. Its administration in cases of tetanus should be commenced as early in the case as possible. One-third of a grain of extract of Calabar bean, dissolved in eighteen minims of water, should be injected every two hours under the skin. If administered by the mouth the extract should be used in preference to the powder, but it should not be administered by the mouth except in milder cases. Out of eleven cases treated in this way nine recovered. (Dr. T. R. Fraser, p 55.)

In a case of acute tetanus treated by subcutaneous injections of Calabar bean (one-third of a grain of the extract dissolved in eighteen minims of water), the effect is thus described: "In about five minutes, the legs, which had been previously perfectly rigid and immoveable, became flaccid and freely moveable by the patient; the abdominal muscles became less tense; and the arching of the spine disappeared." The case did well. It was found necessary to repeat the injections every two or three hours, as the effects lasted only that time. At night it was found of advantage to inject along with the Calabar bean one-third of a grain of morphia. After a time the skin became so tender from the frequent injections, that it was found necessary to substitute for them suppositories containing a grain and a quarter of the extract. When administered by the mouth the effects produced were much inferior. (Mr. Ashdown, p. 59.)

TUBERCULAR MENINGITIS.—*Croton Oil as a Counter-irritant.*—Apply a liniment consisting of one part of croton oil to three of olive oil freely to the scalp. In many cases it will be necessary first to shave the head. As soon as the eruption comes out the symptoms in many cases will be relieved. (Dr. R. S. Turner, p. 254.)

AFFECTIONS OF THE CIRCULATORY SYSTEM.

ANEURISM.—*Iodide of Potassium.*—The author contributes many facts proving that iodide of potassium has in some cases the power of causing solidification of aneurisms, and in nearly all of relieving the sufferings of the patient. Out of fifteen cases great relief was afforded in fourteen, and "in a few" there has been a perfect cure. The dose given should vary from five grains to thirty, three times a day; but so large a dose as thirty grains is often not borne well. Whatever may be the explanation of its mode of action, it seems probable that it is in some measure proportionate to the amount injected, because the relief of pain, which is one of the earliest symptoms of amendment, is not produced till a certain efficient dose has been given. (Dr. G. W. Balfour, p. 144.)

DIGITALIS.—*Therapeutic action of.*—When digitalis kills, it does so not by producing paralysis of the heart, but by giving rise to tonic contraction and spasm of that organ. It is hence a most valuable remedy in the treatment of dilatation, and dangerous only when administered in hypertrophy. When the pulse is feeble and irregular, and more especially when from any cause its feebleness and irregularity are temporarily increased, digitalis is of all known remedies the most useful. (Dr. Fuller, p. 74.)

Digitalis, like other medicines, has a double action, it first excites the vaso-motor system, contracting the blood-vessels, this action being followed by more or less reaction to dilated blood-vessels. The primary action may be obtained alone by giving small doses, the secondary by large doses. Hence, when given for the purpose of checking uterine or other hemorrhages, large doses are not called for, and indeed would be injurious. (Dr. A. Reith, p. 74.)

When digitalis is given in cases of heart disease, it should be in doses of about ten drops every four hours, or half a drachm of the tincture night and morning. It is not likely to benefit functional disorders or palpitation, and

it is inadmissible in cases of aortic regurgitation, for in such cases it might be dangerous to slow the heart's action. Digitalis, however, may be most useful in obstructive aortic disease; but that form of disease which it is most of all adapted for is dilatation with feebleness of action. (Dr. E. Mackey, p. 272.)

The primary action of digitalis is on the sympathetic (vaso-motor) system of nerves; it stimulates this system, and so causes increase in the contractile power of the capillary vessels. It is owing to this that it relieves some local congestions. It has been of service in pneumonia; in uterine and pulmonary hemorrhage; and markedly in hemorrhoids. The first effect of a moderate dose of digitalis is to increase the rapidity of the heart's action; but this is simply owing to the capillary contraction; after from twelve to twenty-four hours the action of the heart is slowed, but not weakened. Digitalis lowers the temperature of the person taking it, sometimes even before the heart action be slowed. (Dr. E. Mackey, p. 274.)

LIGATURE OF ARTERIES.—*Antiseptic System.*—The reason that a silk ligature causes irritation, whilst a metallic one does not, is that the former contains the germs of putrefactive organisms. If a ligature be thoroughly soaked in carbolic acid, so as to destroy these germs, it may be cut off short, and left deeply embedded in a wound with perfect impunity. Ligatures should, before being used, be steeped for some time in a saturated watery solution of carbolic acid. After the wound has been freely treated with carbolic acid dissolved in forty parts of water, it may be closed as usual. The carbolic acid does not impair the tenacity of the fibre of the ligature. The most curious circumstance, and one most unexpected, is that the terminal piece of artery strangulated by the ligature is protected from putrefaction, and rendered devoid of irritating properties. Even the portion of vessel directly compressed by the ligature does not slough, but is absorbed. (Prof. Lister, p. 140.)

Mr. Maunder, of the London Hospital, has tied the carotid on the plan recommended by Prof. Lister. The ligature was soaked in carbolic acid, cut short, and left in the wound, which was closed. In one month the wound was healed, and the thread did not come away. (p. 143.)

A Substitute for the Ligature.—Dr. N. R. Smith, of Baltimore, has recently devised a little apparatus as a substitute for the ligature and acupressure in the deligation of arteries. It consists of a small silver tube, and a fine annealed iron wire passed double through the tube and projecting a loop at one extremity. The tube has a small double slit at one end. The vessel is seized in the loop, which is then drawn tight, and the ends being passed into the slits, are twisted round the end of the tube and cut off, leaving length enough to be seized by the fingers in removing it. When removed, the loop is drawn through the tube, severing the vessel as by a small écraseur. (p. 143.)

PERICARDITIS.—*Veratrum Viride.*—Veratrum viride, by its power of slowing and steadying the action of the heart, is sometimes a remedy of great value in pericarditis. In threatened rheumatic pericarditis ten-drop doses of the tincture may be added to the arthritic mixture. In fully-developed cases two-grain doses of the extract should be given, with a grain of calomel, every two hours until the effects are discernible. (Dr. J. Waring-Curran, p. 79.)

PYÆMIA.—Keep the patient well under the influence of alkalies, the excretions being fully alkaline; and with this continue a full allowance of stimulants and support. Besides promoting secretion and excretion, this plan of treatment tends to prevent that first step of coagulation which, in its secondary effects, plays such an important part in the history of embolism. (Mr. C. S. Jeaffreson, p. 32.)

TORSION OF ARTERIES.—The forceps used for torsion of arteries should be rather broad at the points, and provided with fine interlocking blunted teeth. The artery should be twisted until the part seized comes off, setting the forceps free. The remaining part presents a conical twisted end, which unfurls itself to some extent, but not entirely, and remains completely closed.

During the twisting the inner thick elastic coat is thrown into folds, which are crushed or squeezed together so as to block up the channel of the artery; it then gives way, and is torn through, and is held in this position by the outer coat, which resists longer. Torsion is more difficult than the ligature, requiring more care. (Dr. G. M. Humphry, p. 135.)

"*Free*" *and* "*Limited*" *Torsion.*—In "free" torsion the end of the vessel is simply clasped by a pair of forceps, and twisted freely. In "limited" torsion, before this is done, the vessel is firmly clasped transversely by another pair of forceps, about three-quarters of an inch from its divided extremity. By this means the extent of vessel twisted is limited to the terminal portion, and it is not separated from its vascular attachments for any distance. Limited torsion is more applicable to large vessels. Torsion has decided advantages over the ligature and acupressure-needle; over the former, inasmuch as no irritating substance is left in the wound; and over the latter because the permanent closure depends, like it, not only on the coagulation of blood in the vessel down to the first branch, but also upon the retraction, incurvation, and adhesion of the middle coat. (Mr. T. Bryant, p. 138.)

Torsion of Small Arteries.—It is not even necessary to twist the vessel at all if it is not of large size. If a small artery is firmly compressed by forceps for the extent of half an inch, its coats coalesce, and become mechanically agglutinated together, bleeding being effectually stopped with less injury to the vessel than by torsion. (Mr. S. Wells, p. 139.)

AFFECTIONS OF THE RESPIRATORY SYSTEM.

APHONIA.—*Electricity.*—The external application of electricity seldom restores the voice when it has been lost for any length of time, whether it result from hysteria, debility, anæmia, phthisis, or catarrhal congestion. The direct application of electricity, however, to the vocal cords, is almost always successful. In using the direct current, one pole is introduced within the glottis, and the other pole applied externally. In this way the voice is often immediately restored. The instrument employed by Dr. Mackenzie will be found fully described in the article from which this is taken. When the voice has been restored by the introduction of a pole into the larynx, the effect can often be kept up by the occasional application of the external current. This mode of treatment must be very successful indeed, for the author states that, out of two hundred cases in which he employed it, it was unsuccessful in only four. (Dr. M. Mackenzie, p. 107.)

COD-LIVER OIL.—In cases of consumption with peculiar weakness of stomach, and tendency to retching or nausea, strychnia, in a dose of from $\frac{1}{32}$ to $\frac{1}{24}$ of a grain, proves a most valuable adjunct to whatever vehicle is used. (An aromatic bitter is as good a vehicle as any.) By its means I frequently overcome the fastidiousness of stomach arising from debility, hysteria, or indulgence in alcoholic liquors. Salicine is another efficacious alterative of the same kind. Either of these, although a powerful tonic, has none of the heating properties of iron or quinine. (Dr. C. J. B. Williams, p. 88.)

HÆMOPTYSIS.—Ergot of rye is a remedy of great value in cases of hæmoptysis arising from tuberculous disease. This arises from its remarkable power of inducing contraction of the blood-vessels. The following is the best prescription and has served its author many a good turn: ℞. Ext. ergotæ liq. ʒij (to contract the vessels); tincturæ digitalis ʒij (to steady the heart); acidi gallici ʒj (to clot the blood); magn. sulphatis ʒvj (to relieve congestion); acidi sulphurici diluti ʒj (to assist the rest); infusi rosæ acidi ad ℥viij (to make a mixture.) A sixth part every three hours till hemorrhage is arrested. (Dr. H. Dobell, p. 93.)

NASAL POLYPUS.—*Electro-Cauterization.*—The use of the nasal polypus forceps is in the most experienced hands a bungling and uncertain mode of

removing nasal polypus. By electro-cauterization and illumination of the nasal cavity, as much certainty may be obtained in the operation as in the eye, or other parts capable of inspection by vision. The operator must sit opposite the patient and illuminate the nasal cavity by the ophthalmoscopic mirror. For this purpose the best light is the spirit-oxygen lime light (fully described in this volume, p. 162). In order that the light may penetrate the nasal cavity the introduction of a spring speculum into the nostril is necessary. This speculum has two blades, one of which presses against the septum and the other distends the ala. The electric cautery is then passed down to the neck of the polypus and it is burnt through. The carrier for the platinum wire loop is so thin as not to interfere with vision. (Dr. J. L. W. Thudichum, p. 164.)

PHTHISIS.—*Inhalations.*—Remedies administered by inhalation are really useful in certain cases, chiefly those in which the larynx and trachea are much affected, and in those attended with convulsive cough or offensive expectoration. The use of inhaling instruments is fatiguing and unnecessary. A quart jug of hot water, with a napkin from over the nose down to and around the jug to confine the steam, is all that is needed. To the hot water is added the drug to be inhaled; and creasote or carbolic acid, iodine, chloroform, oil of turpentine, and juice or extract of hemlock, are the articles which I have found most useful. (Dr. C. J. B. Williams, p. 90.)

SENILE CATARRH.—*Cannabis Indicus.*—Cases of chronic senile catarrh with hacking dry cough are much benefited by the administration of cannabis indicus. It seems to soothe the irritated passages, without the disadvantages of opium. It has moreover a specific action in relieving the spasm of the bronchial muscular fibre. Twenty minims of the tincture every two hours is a suitable dose. (Dr. J. Waring-Curran, p. 106.)

TUBERCULOSIS.—The condition of body favouring the development of tuberculosis is a habit of non-digestion of fat. The causes of this habit are such conditions as diminish the consumption of, and consequent demand for, fat in the system. The appetite for, and digestion of fat are originally regulated by the amount of its combustion in the body. Hence the causes of its habitual non-digestion will be those conditions which diminish that combustion. (Dr. D. J. Brakenridge, p. 96.)

It is a well ascertained fact that the digestion and non-digestion of different hinds of food becomes habitual. Impure air, want of exercise, exposure to excessive warmth, &c., seem to cause and favour a habit of non-digestion of fat, by diminishing the demand for it in the system. In this way the tubercular state is produced. In the treatment, the indications are to break this habit, and to restore the lost power of digestion of oils. This will be best done by supplying in increased force what we find to be the chief stimulants to the digestion of fat, *e. g.*, cold, pure air, exercise, &c., and by avoiding all that would tend to confirm the bad habit. Summer is therefore, more to be dreaded than winter, and a cool bracing climate is preferable to a hot relaxing one. (Dr. D. J. Brakenridge, p. 95.)

AFFECTIONS OF THE DIGESTIVE SYSTEM.

CHOLERA.—In an interesting paper written by Drs. McCloy and Robertson, it is shown that only 30·45 per cent. of the cases treated with castor-oil alone died, whilst 71·42 per cent. died of those treated by astringents and stimulants, camphor and iced water, applications of ice, and hypodermic opiate injections. "Diarrhœa ought not to be neglected even for an hour." We should not, however, attempt to check it by opiates or by other directly repressive means, while there is reason to believe that the bowel contains a considerable amount of morbid and offensive materials. We shall favour the recovery by directing the patient to drink copiously any simple diluent liquid —water (cold or tepid), toast-water, barley-water or weak tea, and we must sweep out the alimentary canal by castor-oil, then if necessary soothing it by

an opiate. The opium, however, ought not to be given until the morbid poison and it products have for the most part escaped. (Sir T. Watson and Dr. G. Johnson, p. 111.)

On the first appearance of the symptoms give a draught containing from fifteen to twenty minims of chloroform, with ten to fifteen minims of tincture of opium, with a drachm of spirit to render the chloroform miscible with water. This will almost immediately relieve the cramp which ushers in the disease. If the case should progress give the following drink every hour in ounce doses: ℞. Potass. chlorat. ʒj; acidi hydrochlorici fort. ♏viij; acidi nitrici dilut. ʒiss; aquæ ℥xxiv. M. Liebig's soup should be given in small and frequently repeated doses, in order to supply the waste occasioned by the evacuations. (Dr. T. W. Lowndes, p. 32.)

Dyspepsia.—There are *three varieties* of dyspepsia: 1, The sulphuretted hydrogen dyspepsia, or that accompanied with "rotten-egg" evacuations. This requires farinaceous diet along with a mixture containing strong hydrochloric acid and chlorate of potash, filled up with a vegetable bitter. 2, The carbonic acid dyspepsia, with tasteless eructations, requiring a lean-meat diet, with avoidance of bread, potatoes, and farinaceous food generally. 3, The butyric acid dyspepsia, in which the eructations are sour and acrid. In this form the use of sugar and fat must be proscribed. A fourth form may be styled "tea dyspepsia;" this requires a daily allowance of wine, regularity of meals, and abstinence from tea. (Dr. H. Browne, p. 108.)

Gastralgia.—"There is no such remedy for gastralgia as strychnia, subcutaneously injected in doses of $\frac{1}{120}$ to $\frac{1}{60}$ grain." (Dr. F. E. Anstie, p. 262.)

Hemorrhoids and Prolapsus of the Rectum.—*The Clamp.*—Since the introduction by Mr. Henry Smith of his clamp for the removal of hemorrhoids and prolapsus of the rectum, it has been extensively tried, and gives great satisfaction. The advantages are, freedom from danger, and the short convalescence as compared with that following the use of the ligature. The hemorrhoids are seized by the blades of the clamp, cut off, and the wound freely cauterized with the actual cautery. If mucous membrane alone is removed very little pain is experienced, and it is unnecessary to give chloroform, but when skin is involved it is better to do so. Owing to the back of the blades being lined with ivory, the heat of the clamp does not cause pain by burning the skin. (Mr. H. Smith, p. 156.)

Mr. Wiblin, of Southampton, bears testimony to the great utility of Mr. Henry Smith's clamp in the removal of hemorrhoidal tumours, and to the total absence of secondary complications when this mode of operative procedure is adopted. (p. 155.)

Digitalis.—Digitalis is of use in the treatment of piles, and this owing to the primary action of the remedy being to cause contraction of the capillaries, and the secondary action slowness and power in the contractions of the heart. Hence its value in the removal of local congestions, such as hemorrhoids. The bowels must be relieved by enemata, or castor oil, and digitalis administered in say ten drops of the tincture every three hours. (Dr. E. Mackey, p. 274.)

Belladonna, etc.—In the same way as digitalis acts in cases of piles—as explained in an article by Dr. Dobell in this volume—so does belladonna. It acts through the intestinal branches of the solar plexus causing contraction of the muscular walls of the vessels of the part, and restoring tone to the paralysed muscular fibres of the colon and rectum. The stokers on board steamers are in the habit of using as an application to external piles, and with great success, the grease which runs from the hot bearings and excentrics in the engine room. It requires mixing with a little lard to form an ointment. It contains lead and copper. (Dr. J. Mulvany, p. 160.)

Hernia.—The following plan of treating hernia with a view to its radical cure is simple and effective. Invaginate the scrotum by means of the forefinger of the left hand, well oiled, and pass a ligature by means of a long curved needle to the apex of the invagination and through the parietes. Then withdraw the needle, thread it with a fresh ligature and pass it

along the dorsal aspect of the finger and through the parietes, but making it emerge at the same point in the skin as the first ligature. The needle carrying the first ligature is to be passed along the palmar aspect of the finger. After the withdrawal of the needle the second time the plug is to be pulled into the canal, the apex being firmly tied against the apex of the invagination, and the threads firmly knotted over a small piece of wood. The plug is to be left until pus flows freely from beside the ligatures. After the removal of the plug and ligatures a pad and spica bandage is to be applied, and the patient kept in bed for some days. A truss should be worn for some months afterwards, until the tissues have become consolidated. (D. J. Fayrer, p. 152.)

Laryngoscopy.—*Dr. Thudichum's Medical Lantern.*—No oil lamp gives sufficient light for laryngoscopic purposes, however artfully contrived. Dr. Thudichum describes a simple form of apparatus by which a most intense light is producible by a jet of oxygen on a piece of lime placed in the flame of a spirit-lamp. We refer our readers to the article itself for a description of the lamp. (p. 162.)

Pyrosis.—*Sulphurous Acid.*—Sulphurous acid is a remedy of great value in the treatment of pyrosis. "In every instance in which it has been employed it has, in a very short time, completely arrested the water-brash secretion." Its good effects are probably due to the destruction of vegetable germs, which may be detected by the microscope in great abundance. (Dr. H. Lawson, p. 108.)

Rectum.—*Lumbar Colotomy.*—The author relates some cases illustrating the advantage of lumbar colotomy in cases of intractable disease of the rectum, such as cancer and stricture. He says, "an artificial anus appears very repugnant to persons in health, but the distress which arises from frequent painful scalding motions, and from incontinency, is so great that it is not surprising that patients are willing enough to submit to this operation in order to get relief, even without any prospect of ultimate cure." The operation is very easy and simple. The incision should be transverse and carefully deepened until the colon bulges into the wound. In the case in which the operation is described there was hardly any hemorrhage. (Mr. T. B. Curling, p. 154.)

Stricture of the Æsophagus.—The author gives an interesting case of stricture of the æsophagus, from accidental swallowing of some caustic potash. Gastronomy was about to be performed to save the patient's life, when unexpectedly she began to improve, and in the end, although still suffering from stricture, she can swallow solids when carefully minced. This improvement did not result from bougie treatment. He remarks, "it is clear that these cases are never hopeless, and that it is quite possible that just when the last stage appears imminent, a change for the better may ensue." (Mr. J. Hutchinson, p. 150.)

AFFECTIONS OF THE URINARY ORGANS.

Abscess of the Prostate.—Abscess of the prostate is not a common affection. The symptoms are such as might be expected, the principal being pain and difficulty in micturition, or complete retention. The finger introduced into the rectum will determine the nature of the case. The abscess must be opened from the rectum as early as possible, in order to avoid its bursting into the urethra and the urine getting access to the interior of the prostate. The operation is best performed by a bistourie caché, or by a long narrow scalpel protected by adhesive plaster to within half an inch of its point. After the puncture the wound may be opened a little by the introduction of a pair of dressing-forceps closed at first, then allowed to open. A rapid recovery usually results. (Mr. C. F. Maunder, p. 186.)

Action of Acids on the Urine.—By giving alkalies you *can* render the urine alkaline, but you cannot render alkaline urine acid by giving mineral acids. Benzoic and citric acids are the only ones which do influence

the reaction of the urine. The best way to give benzoic acid is in pills, as it is insoluble in water. (Sir H. Thompson, p. 178.)

ATONY OF THE BLADDER.—There is no such thing as paralysis of the bladder apart from disease of a nervous centre. But atony of the bladder, with great distension of its cavity by retained urine, and wasting and thinning of its muscular coat is common. This results usually from some slight obstruction at the neck of the bladder, perhaps by a nipple-shaped projection of a portion of prostate. The regular emptying of the bladder three or four times daily by the gum elastic catheter is the principal treatment required in these cases. For pure atony uncomplicated with prostatic enlargement, a little aid may be sometimes afforded to the patient by the application of electricity. For this purpose one pole of an electro-magnetic machine is applied to the sacrum, and the other carried into the bladder by means of a gum catheter containing a wire. (Sir H. Thompson, p. 119.)

CHRONIC CYSTITIS, OR CATARRH OF THE BLADDER.—The most common cause of this disease, which is very improperly named, is inability of the bladder, either from atony of its coats, or from prostatic obstructions, to empty its contents. It is no more a disease of itself than dropsy is. There is in this affection a great quantity of viscid mucus in the urine, and if the vessel be emptied the urine passes off first, and the mucus follows in a tenacious mass. The first thing to be done is to empty the bladder by a catheter, once, twice, or three times a day, in the easiest manner possible. If this does not succeed, the bladder must be washed out at least once a day with a little warm water before withdrawing the catheter. Never, however, under any circumstances must more than two ounces be thrown in. If this does not answer, inject the bladder daily with four ounces of warm water containing one grain of acetate of lead. After this comes the dilute nitric acid ; one or two minims to the ounce of water. An injection of warm water containing glycerine and biborate of soda is a very useful one indeed. (Sir H. Thompson, p. 176.)

Of the number of vegetable decoctions and infusions recommended in chronic cystitis none is better than that of the underground stem of the *triticum repens*, or common couch grass. For use, boil two ounces in one pint of water for a quarter of an hour; the strained liquor to be taken by the patient in four doses in the twenty-four hours. (Sir H. Thompson, p. 178.)

DIABETES.—*Dilute Phosphoric Acid.*—Dilute phosphoric acid is recommended by the author as having proved of much service in the treatment of diabetes. In the case related by him he gave twenty-five drops three times a day after meals. This was seconded by the ordinary dietetic treatment of the disease, and of such remedies as iron and cod-liver oil. The patient, however, discarded everything except the acid. Under its use his thirst lessened considerably, and all his symptoms improved. (Dr. J. G. Thornley, p. 266.)

EXAMINATION OF URINE.—If you want to get a specimen of urine free from any possible admixture with products from the bladder or urethra, pass a soft gum catheter of medium size into the bladder whilst the patient is standing, and draw off his urine; then by frequent small injections of warm water completely cleanse the mucous membrane of the bladder. Now, the catheter still remaining in, permit the urine to pass, guttatim, into a test tube. You now have a specimen of urine which, for appreciating albumen, for determining reaction, and for freedom from vesical pus and even blood, and from cell-growths of vesical origin, is of the greatest value, and will often furnish you with the only data previously wanting to complete an exact diagnosis. (Sir H. Thompson, p. 182.)

HEMORRHAGE FROM THE BLADDER.—Besides acute cystitis, the symptoms of which are conspicuous enough, hemorrhage from the bladder can only be from stone or from tumour. As a rule, blood from a tumour is larger in quantity than from stone. If the tumour is malignant it may be felt, and the pain is often severe ; if villous, it gives an even pale red tint for days together to the urine ; and in both cases the blood is florid, unless it is long

retained in the bladder, when dark sanies, like coffee-grounds results. (Sir H. Thompson, p. 179.)

LITHOTOMY.—*Comparative Safety of the Several Operations.*—The highest average of success in the old lateral lithotomy operation in the hands of Cheselden and other great operators has been one death in five, six, seven, or eight. In the medio-lateral operation, there is ample evidence to show that the average mortality from all operations, by whomsoever performed, is not more than one in twelve, while in some practised hands a still higher degree of security has been attained. (Dr. A. Buchanan, p. 175.)

LITHOTRITY.—Preliminary injection of the bladder with warm water is quite unnecessary, and it is not even necessary to ask a patient to hold his water beforehand, nor when he micturated last. If there is a small stone with a large quantity of water, you may hunt long before you find it, a proceeding which will give much more pain and uneasiness than if a small quantity of water only were present. The blades of a lithotrite do not close upon each other accurately, so that injury to the bladder by them is unlikely. (Sir H. Thompson, p. 166.)

When you have a large stone to deal with, the fenestrated instrument is the best. In this, the female blade is entirely perforated, allowing the male to pass through it. As this instrument is not so safe as the flat-bladed one, which reduces the stone to powder, it should be used as little as possible. The fragments made by the fenestrated instruments are always rough and irritating. Clover's apparatus is very useful in certain cases. For example, a patient has no power of making water, except by a catheter; then few fragments, probably, will be passed in that way, and this apparatus is the very thing. After crushing, this large catheter is introduced, the fragments are sucked out by the action of the powerful india-rubber bottle which is attached to it. The process is rather trying, however, for the bladder; and it costs rather more pain and time than an ordinary sitting for lithotrity. (Sir H. Thompson, p. 167.)

Never attempt to drag from the bladder even a very small calculus. There is no use in injuring the neck of the bladder and the urethra by such a procedure, when by a turn of the screw it can be reduced to powder. (Sir H. Thompson, p. 167.)

PUNCTURE OF THE BLADDER PER RECTUM.—*New Trocar and Canula for.*—Mr. John D. Hill, of the Royal Free Hospital, recommends a canula containing an inner tube, so contrived that the urine does not continually dribble away, but can be drawn off at pleasure. It is evidently an improvement on the canula usually used. It may be obtained from Messrs. Weiss. (p. 187.)

PROSTATIC DISEASE.—Nothing is easier than to make a mistake in a case of prostatic disease; for instance, a patient complains that he frequently wets his bed or loses his urine whilst walking, and yet asserts that he can make water without difficulty, and that he passes plenty of it. Nothing is more natural than that such symptoms should be mistaken for those of paralysis rather than of retention. In the case related this actually was the case, and on a catheter being passed the bladder proved to be full of urine. (Mr. J. Hutchinson, p. 185.)

Hæmaturia in Chronic Prostatitis.—A slight appearance of blood mixed with the last few drops of urine is not a rare occurrence in chronic prostatitis. (Sir H. Thompson, p 180.)

RENAL CALCULUS.—If we have nothing else to guide us as to the nature of a renal calculus, we may assume it to be lithic acid, as this occurs at least fifteen to one as compared with oxalate of lime. Of all medicinal remedies perhaps none are so valuable as mineral waters, especially those which have sulphate of soda, largely diluted, as the main ingredient. Of these Carlsbad is the type. Vichy water is not suitable at all, if not absolutely injurious it is at least inferior to potash. Vichy water is a strong natural solution of carbonate of soda. (Sir H. Thompson, p. 182.)

RENAL HÆMATURIA.—It is in renal more than in any other form of hæmaturia that direct or internal astringents or styptics are useful. Of these, per-

haps, none is better than infusion of matico in doses of two ounces every two or three hours. (Sir H. Thompson, p. 180.)

BONES AND JOINTS.—AMPUTATIONS, FRACTURES, DISLOCATIONS, ETC.

ABSCESS IN THE KNEE-JOINT.—The advantage derivable in cases of abscess in important parts, from the use of carbolic acid, is well illustrated by a case of abscess in the knee-joint related by the author. He allowed the matter to escape under what Mr. Lister has termed the antiseptic veil. A paste of carbolic acid, linseed oil, one part to three, and whiting, was applied to the wound on lead paper. Slight pressure was placed on the sac of the abscess by two pads of lint, on each side of the joint, with a bandage. Next day the patient was free from pain, but no pus escaped on removing the dressings, nor did any afterwards form. The recovery was rapid and complete. (Mr. T. Hamilton, p. 127.)

ACUTE NECROSIS.—*Antiseptic Treatment.*—A case of necrosis, showing the marvellous advantages to surgery from the antiseptic principle of treatment, is related by Prof. Lister. A lad received a severe injury to the leg, followed by abscess, and resulting in death of a portion of the tibia, as evidenced by the point of the bistoury coming against the bare bone. Various abscesses were successively opened for eleven weeks, and yet rapid recovery ensued without any exfoliation of bone, or any thickening from the formation of fresh bone. In opening the abscesses a piece of lint steeped in carbolic oil was placed over it, and the edge then raised to admit of the incision by a bistoury dipped in carbolic oil. The lint was then allowed to fall, and the matter caused to flow out beneath it. An external antiseptic dressing was then applied and changed daily. That the bone was really dead was also proved by the fact that when a probe was passed into the wound, several weeks after the first abscess was opened, it came into contact with it. (Prof. Lister, p. 142.)

AMPUTATIONS.—Mr. Wharton, of Dublin, recommends a modification of the late Mr. Teale's mode of amputation. Mr. Wharton makes a single rectangular flap, the breadth of which shall be equal to half the circumference of the limb, and greater by one-fourth than its length, say from the front aspect of the leg, and then to cut through the calf and the bones on the same plane. This, however, would be no improvement. The reason why Mr. Teale considered the short posterior to be necessary, was that "the posterior flap being made, as a rule, of the powerful flexor muscles, retracts immediately almost to the point at which the bone is to be sawn through. If, however, the posterior tissues be divided opposite the point selected for sawing through the bone, they immediately retract to a point higher up, and thus leave the posterior surface of the bone projecting and denuded of soft tissues." (Mr. Pridgin Teale, *British Medical Journal*, *Nov.* 7, 1868, *p* 500.)

In all amputations in continuity, the patient's immunity from osteo-myelitis and subsequent pyæmic poisoning is greatly influenced by the point at which the saw is applied. The nearer to the centre of the bone this is done, the greater probably will be the chances of inflammation and disastrous sequelæ. (Dr. J. Brinton, Philadelphia, p. 126.)

Amputation at the Knee-joint—Amputation at the knee-joint is a more successful operation than amputation at the knee, in which the bone is sawed through the condyles. This has been shown most conclusively by the statistics of the American war, and by the results of private practice in America. (Dr. J. Brinton, Philadelphia, p. 126.)

ANTISEPTIC SURGERY.—Chloride of zinc as an antiseptic application has certain advantages peculiarly its own, rendering it a more suitable application to wounds in which, from the circumstances of the part concerned, it is impossible to maintain an efficient external antiseptic dressing, so that the application must be made once for all at the time of the operation. The effects of an application of chloride of zinc are permanent, so that one ap-

plication suffices. Chloride of zinc is highly valuable after the removal of portions of the maxillary bones, or of the tongue, or portions of that organ. In ordinary cases, however, carbolic acid is preferable. It is a most potent poison to the low forms of life which determine putrefaction, and its volatility causes it to exercise its properties upon other parts than those actually in contact with it. Lastly, carbolic acid is a local anæsthetic. (Prof. Lister, p. 127.)

Antiseptic Treatment of Wounds.—The oil and chalk, or putty, with carbolic acid, is rather a disagreeable mode of dressing wounds, so Mr. Lister has tried to improve the application by using emplastrum plumbi, mixed with one-fourth part of bees-wax and one-tenth part of carbolic acid. This is used as a plaster spread on calico, in a layer of about one-twentieth of an inch thick. The exact formula is given in Mr. Lister's paper. (p. 133.)

Compound Fracture of the Skull with Depression of Bone.—The practice of trephining and elevation is strongly to be recommended in all cases of compound fracture with depression; but it is in order to prevent inflammatory symptoms, not to relieve any imaginary state of compression of the brain. I have never seen a case in which there seemed definite reason to think that depression produced symptoms *per se*. (Mr. J. Hutchinson, p. 47.)

Dislocation of the Shoulder-Joint.—*Manipulation.*—The author describes a new method of reducing dislocation of the shoulder downwards. Stand with your right shoulder touching the patient's right shoulder (supposing the dislocation to be on the right side) but facing in the opposite direction to him. Now seize his right hand with your left, at the same time separating his arm from the side. Then pass your right arm under his axilla, hugging the humerus. While passing your right leg behind his right leg, bring his hand underneath your right arm, with your left. Now raise the humerus forcibly upwards with your right, and bend his elbow under the same arm, pressing downwards; at the same moment direct him to fall away from you with his whole weight, and in a moment the head of the humerus will go into its proper place. (Mr. J. P. Bookless, p. 125.)

Penetrating Wounds of the Chest.—In a case of penetrating wound of the chest, the lung being injured, and hemorrhage copious, the wound should be thoroughly plugged with lint soaked in carbolic oil; the lint should be passed into the pleural cavity, so as to destroy the organic germs which have obtained access through the wound. If this is not done, the blood in the pleural cavity will putrefy. The lint should be removed the next day, under the protection of a large piece of lint dipped in the oily solution of carbolic acid, and the carbolic paste should be continued to the wound externally until it is healed. (Prof. Lister, p. 129.)

AFFECTIONS OF THE SKIN.

Acne.—The following ointment produces good results: ℞. Hydrargyri iodi virid gr. x.; sulphuris ʒi.; adeps ʒi. A little oil of bergamot or bitter almonds may be added to cover the smell of the sulphur. If the inflammation in the parts becomes acute, the constant application for a few days of the "glycerole of starch" is of benefit, and in the place of soap the following may be used:—Take of glycerine, by weight, five parts, yolk of egg, four parts, mix; a little of which can also be applied before exposure to cold, heat, &c. (Dr. H. S. Purdon, p. 221.)

There is no better method of curing acne than that of Mr. Startin. It consists in destroying the inflamed sebaceous follicles by touching them with acid nitrate of mercury. The acid should be applied with a fine glass brush in minute drops to the apices of the inflamed spots. Great care should be taken not to apply too much, and any superfluous liquid should be at once absorbed with blotting paper kept in readiness. Iron or arsenic may be pre-

scribed internally, and a bichloride lotion or mercurial ointment for house application. The use of soap must be forbidden. (Mr. J. Hutchinson, *London Hospital Reports*, p. 220.)

ARSENIC IN SKIN DISEASES.—Arsenic is of no use whatever in venereal skin diseases, nor in the ephemeral and exanthematous class of affections. It is not useful in the eruptions produced by specific poisons, as many of the forms of lichen; in short, in any eruption which can be traced either to a local or specific cause. With these exceptions, arsenic is almost unexceptionally successful, and in all cases of chronic idiopathic affection of the skin, including lichen simplex, lichen agrius, prurigo, chronic erythema, impetigo, porrigo, alopecia, ecthyma, rupia, lepra, psoriasis, pityriasis, eczema, lupus exedens, &c., provided always, and in all cases, that it be administered discreetly, perseveringly, and with such adjuncts (purgatives, alteratives, tonics, or eliminants) as the case may require. It may be added that it is especially useful in those cases of skin disease which depend on uterine irritation or irregularities. (Mr. T. Hunt, p. 214.)

BENZOATED OINTMENTS IN SKIN DISEASE.—No ointment or oil is suitable for application to the skin that has not been previously benzoated. (Mr. E. Wilson, p. 207.)

CARBOLIC ACID IN SKIN DISEASES.—Carbolic acid promises to prove a local remedy of great value in skin diseases, especially, of course, those parasitic in their origin. It may be applied as a lotion of the strength of half a drachm to four ounces of water. Three cases respectively of chronic eczema, impetigo, and of psoriasis inveterata are related, in all of which the above application proved curative. (Dr. F. P. Mann, p. 258.)

CUTANEOUS DISEASE.—Cutaneous disease is a lowered state of vitality; in fact, a debility. We can hardly realise a case which will not get well spontaneously, if we succeed in elevating the vital power. (Mr. E. Wilson, p. 205.)

There are no such things as specifics in skin diseases. Arsenic is a neurotonic, applicable to every disease wherein there is loss of power in the peripheral nervous plexuses, and a consequent disorder of capillary circulation and of cell nutrition. Sulphur is simply a parasiticide in common with other substances. Tar, again, is simply a stimulant, while the bichloride of mercury is both a stimulant and caustic. (Mr. E. Wilson, p. 204.)

Although innumerable ointments and lotions have long been employed in cutaneous diseases, the active agents in all of them, with few exceptions, are not the drugs which they hold in suspension or solution, but simply the oily or watery matters which constitute the bases of these preparations. The various dry powders, such as sulphur, oxide of zinc, calamine, &c., which are mixed into ointments, give to fat a consistence which renders its action permanent, and prevents its rapidly melting, or being too readily lost or absorbed. Thus sulphur ointment is an excellent application for scabies, but the sulphur has no other effect than that of causing the follicles and grooves inhabited by the insect to be more readily blocked up. In the scaly eruptions, such as psoriasis and lepra, the admixture of pitch or tar is essential to success; but pitch pills given internally have no effect whatever. (Dr. J. H. Bennett, p. 222.)

ECZEMA AND MOIST SKIN DISEASES.—In all cases where there is excessive moisture on the surface, originating in vesicular, pustular, or ulcerative diseases, the constant application of water is necessary. Occasional applications are of no use whatever. For this purpose, lint well saturated in water is first applied to the affected parts. This must be covered with oil-silk. The virtue of the lotions so frequently recommended resides only in the water. The addition of a very small amount of carbonate of soda renders the water more emollient. (Dr. J. H. Bennett, p. 223.)

FAVUS.—There is no special virtue whatever in the various unguents which are used for the cure of favus. Simple oil, or grease of any kind, answers the same purpose. First remove the crusts by poulticing, and, secondly, keep the clear surface covered with oil. So long as this is done, the head can be kept free from disease, and if it is done long enough the case may be

cured. A permanent cure cannot be effected by depilation. (Dr. J. H. Bennett, p. 223.)

GLYCERINE IN SKIN DISEASES.—Glycerine is a remedy of peculiar value in certain skin diseases, from its property of assuming a semi-solid, or rather gelatinous form, when a small quantity of starch is added to it, and the mixture subjected to a temperature of 240°. (Mr. E. Wilson, p. 207.)

GLYCERINE OF TANNIN.—Glycerine of tannin is a very valuable application in a variety of trivial but troublesome complaints. These are, excoriation of the inside of the nose with discharge of a thin sanious fluid; cases of sanious or purulent discharge from the ears, so commonly met with in weak and unhealthy children; chronic vaginitis of children; eczema, in which disease the itching, tingling, and burning so commonly present are at once removed; the eczema which occurs behind the ears of children is admirably treated with the remedy. Glycerine of tannin is an extremely useful application to the throat for a variety of purposes, not during the existence of acute inflammation, but during its subsidence. (Dr. S. Ringer, *Practitioner*, *July*, 1868, p. 27.)

HERPES.—*Neurotic Relations of.*—Cases not unfrequently occur which tend to prove that there is a reflex relation between a subcutaneous or deep-seated organ and the skin above it or in its neighbourhood, and that, owing to disease in the deep-seated organ, herpes may be caused in a part supplied by a nerve in connection with that supplying the diseased part. (Dr. H. Jones, p. 219.)

LUPUS.—*The Actual Cautery.*—In cases in which there is much swelling or hypertrophy of diseased tissue, the actual cautery rather freely applied is much preferable to the use of the fluid escharotics. The point of the iron may be thrust deeply into the tissues in some parts, and particular care must be taken to cauterize the edges of the patches. Two or three applications at intervals of a month are usually needed. The good effects must not be expected quickly; for awhile the state appears to have been made worse, but after some months the advantage gained becomes apparent, and scars take the place of ulcers. (Mr. J. Hutchinson, p. 221.)

OIL AND WATER IN SKIN DISEASES.—The really active agents in the treatment of most skin diseases are oil and water. While watery applications have no effect on the dry eruptions, so greasy substances have none upon those which have fluid discharges. (Dr. J. H. Bennett, p. 224.)

PORRIGO FAVOSA.—*Iodide of Sulphur.*—After softening and detaching the crusts by the application of linseed-meal poultices, let an ointment composed of iodide of sulphur one drachm, and lard an ounce and a half, be well rubbed into the diseased patches night and morning. This will probably answer better than the use of sulphur or citrine ointments. (Dr. D. Donovan, p. 218.)

PRURIGO.—Nearly all cases of prurigo arise from the pediculus corporis. This insect differs from the other two species, which infest respectively the head and the pubes, in that it dwells on the under-clothing, and also deposits its eggs on the under-clothing. Hence if the skin is ever so carefully examined nothing is discovered, and even the shirt requires great care to discover the cause of the affection. The nits are often found in the inside of the wrinkles or folds about the waist. Warm baths and washing the clothes have no effect whatever in killing the parasite. The only way to destroy the ova in the clothes is to bake them. It is also a good plan to grease the skin with very dilute citrine ointment (unguentum hydrargyri nitratis), or indeed with any greasy substance, and this for the same reason that olive oil or lard, *per se*, is a cure for the itch. An ointment containing the oil obtainable from stavesacre seeds is a capital application, better indeed than the citrine ointment. (Dr. B. Squire, p. 215.)

PRURITUS OF THE SKIN.—No remedy is better than creosote mixed with ten times its bulk of oil. (Dr. J. H. Bennett, p. 223.)

VENEREAL AFFECTIONS.

CONSTITUTIONAL SYPHILIS.—*Calomel Vapour Bath.*—The calomel vapour bath, when properly administered, produces all the therapeutical actions which can be produced by mercury, without any of its bad effects. For this reason its use is admissible in states of great debility. The effect of the bath is increased when the vapour is inhaled, but inhalation alone does not produce satisfactory results. A drachm of calomel should be used for each bath. The patient should be sweated moderately, and kept in the bath from twenty-five to forty-five minutes. As a rule, a course of baths extends over a period varying from six weeks to two months. Salivation never occurs. Swelling and tenderness of the gums, however, testify to the action of the remedy. As a rule, patients improve in appetite, and increase in weight during the treatment. (Mr. H. Lee, p. 121.)

SYPHILITIC ULCERATION OF THE THROAT.—*Sulphurous Acid Spray.*—Dr. Purdon, of Belfast, relates a case of intractable syphilitic ulceration of the throat which healed in three weeks under the use of sulphurous acid spray. It had resisted other remedies for three months. (p. 268.)

AFFECTIONS OF THE EYE AND EAR.

ABSCESS OF THE LACRYMAL SAC.—If after the nasal duct is patent the cure is not spontaneous, the best plan of treatment is to slit up the lower canaliculus, and apply a weak solution of nitrate of silver to the interior of the sac once or twice a day, washing out the sac with injected water a few times during the day. (Mr. J. Z. Laurence, p. 196.)

ATROPINE.—As a sedative to the eye, atropine, as a very occasional thing, not only entirely fails, but acts as a direct irritant, and may even produce the most acute and troublesome symptoms. These effects cannot be accounted for by the small amount of free acid present in the solution of atropine used, for we daily use in ophthalmic practice salts which contain much more free acid than the sulphate of atropia, without the production of such symptoms. It is singular that in some cases in which atropine produces symptoms of acute irritation, belladonna can be used without any ill effects. A second group of symptoms which may be caused by atropine is an erysipelatous condition of the eyelids and surrounding integuments, with redness and chemosis of the conjunctiva. (Mr. G. Lawson, p. 199.)

DEPRESSION OF CATARACT.—Depression of cataract has fallen quite out of fashion, but it compares favourably in its results with the newer operations. It is applicable to all kinds of cataract, whether hard or soft; the consecutive accidents are less serious and less dangerous than those which follow extraction; and lastly, should the operation, in consequence of some accident, fail, it can be repeated twice or thrice, without danger, on the same eye. In performing the operation, the anterior capsule must be opened out widely, as otherwise a secondary capsular cataract is liable to form. This must be done before the lens is depressed and sunk, as otherwise the capsule is too yielding to be easily incised. In sinking the lens the breadth of continuity in the anterior capsule is much widened, and reunion is impossible. A cataract of soft or cheesy consistence may be broken up with the needle, the nucleus only being sunk in the vitreous. A hard cataract must be sunk by a pretty quick, but delicate, movement of the needle, so that it becomes buried in this humour, without coming into contact with the bottom of the chamber, on which it would act like a foreign body. (Prof. Quaglino, p. 194.)

FOREIGN BODIES IN THE EAR.—The best way to remove foreign bodies from the ear that I know of is by the use of a loop of wire. It is free from risk, which the use of the scoop is certainly not. (Mr. J. Hutchinson, p. 204.)

Pass a small piece of india-rubber tubing down to the foreign body, so as neatly to adjust it to its surface. Then by means of a syringe inserted in the free end of the tube make gentle suction by drawing out the piston rod. This method requires some practice, and nice manipulation in order to insure success. When the foreign body is spherical it may often be removed by a rolling-out plan. For this purpose slightly turn the point of a curved suture needle so that when the finger is passed along the concave surface it detects a slight "burr." Pass this between the foreign body and the wall of the meatus, and in pulling it forwards catch the foreign body with the point of the needle so as to cause it to roll somewhat outwards. This process must be repeated until it is extracted. (Mr. A. G. Brown, p. 203.)

HYPERMETROPIA AND MYOPIA.—How may we detect by means of the ophthalmoscope that the eye is abnormal as to length? Whenever, without the object-lens, any of the details of the fundus—vessels, disc, patches, &c.—are easily seen, we may be quite sure that the globe is either too long or too short, or that the lens is wanting. If these objects are seen very easily, and the image very bright and beautiful, then, in all probability, it is an inverted image, and the eye is myopic. If only large trunks of vessels have been seen, and these not easily kept in view, then probably it is the erect image, and the eye hypermetropic. (Mr. J. Hutchinson, p. 190.)

IRITIS AND THREATENED GLAUCOMA.—The hypodermic injection of atropine appears to promise the most valuable results in painful iritis, and especially in threatening glaucoma. "I firmly believe that in two cases I have succeeded in preventing the latter affection from developing itself; at least the most threatening symptoms were present, and rapidly subsided under the use of one-sixtieth of a grain injections of sulphate of atropine. (Dr. F. E. Anstie, p. 261.)

LACRYMAL DISEASE.—Undoubtedly the proper cure for lacrymal disease is removal of the lacrymal gland. The distressing epiphora (watering) ceases, and this results whether the whole or a part only of the gland is removed. It is not found that the eye becomes dry. The moisture and lubricity of the conjunctiva remain unaffected. (Mr. J. Z. Laurence, p. 196.)

OPACITIES OF THE CORNEA.—Evert the upper eye-lid, and brush a grain or two of sulphate of soda lightly over the surface with a camel-hair pencil. The application may be repeated every or every other morning, or twice a week, according to the reaction that follows. After the continued use of the remedy for some weeks, the opacity is observed to become fainter. In some cases, when the reaction produced by the introduction of the pure salt is too violent, it may be allayed by the addition of a little starch. (Dr. H. Power, p. 202.)

OPACITIES OF THE LENS.—The catoptric test is now rendered quite obsolete, for by means of oblique illumination, a far easier and more certain thing, any one of the slightest skill can determine at a glance the condition of the patient's pupil and of his crystalline lens. The least possible streaks of an incipient cataract become by its aid conspicuously definite. A candle and a two-inch convex lens are the only things required. The pupil should be dilated with atropia, and the candle having been placed to one side the patient's head, the lens is held so as to receive its light and concentrate it to a pencil, which is thrown upon the patient's eye. All the superficial parts may thus be brilliantly lighted up. (Mr. J. Hutchinson, p. 188.)

OPHTHALMIA.—*Chloride of Zinc.*—Chloride of zinc used in a solution of two grains to the ounce is a capital astringent application in certain forms of ophthalmia. It is suited for the same class of cases that we use nitrate of silver or alum for, *i. e.*, the catarrhal or purulent. It is less painful than nitrate of silver, and may be used freely to the youngest infant. (Mr. J. Hutchinson, p. 201.)

OPHTHALMIA TARSI.—*Epilation.*—By far the quickest mode of cure is by the careful and complete removal of the hairs. In bad cases two or three removals, at intervals of two weeks, are necessary. The hairs grow again very quickly. The disease consists of a chronic inflammation of the hair-sheaths of the eye-lashes and of their proper glands. (Mr. J. Hutchinson, p. 199.)

OPHTHALMOSCOPY.—Always proceed systematically. Examine the eye first without the object-lens, and ascertain the state of the cornea, lens, and vitreous. No mistake is easier to make or more frequently made, than by the immediate employment of the inverted image to overlook the fact that the media are not perfectly transparent. (Mr. J. Hutchinson, p. 190.)

In examining the right eye direct the patient to look over your left shoulder, not full in your face; and when examining the left eye he must look over your right shoulder. (Mr. J. Hutchinson, p. 190.)

SETONS IN EYE DISEASES.—The author says that he has of late years formed a still higher opinion of the efficacy of setons in the treatment of certain chronic affections of the cornea than he formerly held. Chronic ulcerations of the cornea attended with much intolerance of light are the cases which require them. They should be placed amongst the hair of the temple, so as not to be seen, and that no visible scar may be left. (Mr. J. Hutchinson, p. 201.)

MIDWIFERY, ETC.

DEBENHAM'S WHALEBONE FILLET.—Mr. R. K. Debenham describes a whalebone fillet which is likely to be of considerable use in cases of lingering labour—cases hardly calling for the use of the forceps. It is soft and pliant, and easily carried in the pocket. It consists of two long loops of whalebone interlaced, the free ends terminating in handles similar to forceps, but shorter, a peg being attached to lock them when required. The loops are ten inches long by three-quarters of an inch wide. In adaptation it is like the fillet, being passed over the chin or occiput. To apply it the blades are pressed together side by side beneath the head, like the lower blade of the forceps. The posterior blade is now swept round the head, and brought opposite its fellow. This requires a little careful manipulation. (p. 238.)

HYSTERIA.—*Local Anæsthesia of.*—In the cases of local anæsthesia apt to occur in hysteria, the application of the electric brush (made of fine wire) is the best remedy. A pretty strong induced current should be passed along it. (Mr. J. N. Radcliffe, p. 54.)

HYSTERICAL VOMITING.—There is undoubtedly a form of vomiting which is hysterical in its nature. To cure it we must cure the hysterical state; for remedies directed to the stomach are almost useless. (Dr. H. Salter, p. 244.)

INCONTINENCE OF URINE IN CHILDREN.—Incontinence of urine occurs in two classes of children—the excitable, restless child, and the stupid and listless child. In the first case, remove as much as possible the sources of over mental stimulation, procure country air, and administer steel wine and cod-liver oil. In the second class avoid punishment, which only stupifies the child more, and try to develop the mind as much as possible. Belladonna is by far the best remedy in these cases, and indeed has a most marked effect. After it nux vomica may be tried. (Sir H. Thompson, p. 120.)

There are cases in which incontinence of urine is the principal, if not only, symptom, for no disease of the passages or of the bladder otherwise than contraction can be found. The proper treatment is to distend the bladder as much as possible with plain warm water, so as to stretch the contracted muscular fibres. In some cases an injection of morphia is of service. (Dr. B. Hicks, p. 252.)

IRRITABLE UTERUS.—"Irritable uterus" is nothing more nor less than reflexion of the uterus of a marked form, and the symptoms can be made to disappear and the patient restored to comparative—often to perfect—health, by remedying the defect and by restoring the uterus to its proper shape. The retort shape of the uterus may always be detected by careful examination. The most satisfactory method of treatment consists in the application of pressure behind the cervix uteri, maintaining the cul de sac of the vagina behind the cervix in a high position in the pelvis. A modification of Hodge's pessary answers this purpose very completely. The upper part of the ring

prevents the descent of the fundus backwards, and by degrees the flexion is rectified. (Dr. G. Hewitt, p. 248.)

New Uterine Douche.—Dr. Hermann Beigel recommends a new form of uterine douche. Its mode of operation will be seen at once by referring to the woodcut at page 247.

Ovarian Neuralgia.—In cases of ovarian irritation or neuralgia, give an eight-ounce mixture containing two drachms of the muriate of ammonia, with five-drop doses of tincture of aconite. This combination of remedies has sometimes a most marked effect in causing the subsidence of the pain. (Dr. J. Waring-Curran, p. 250.)

Puerperal Convulsions.—The opinion has been very strong that manual or instrumental interference in cases of puerperal convulsions, even to the extent of assisting the dilatation of the os by the finger, is prejudicial. This is quite erroneous. Before labour has really set in, such remedies as chloroform, and in some appropriate cases venesection, are the most reliable remedies; but after the commencement of labour, instrumental interference is sometimes called for, and may with safety be resorted to. (Dr. J. Cappie, p. 227.)

Speculum Uteri.—For vaginal fistula, and other explorations in this neighbourhood, Weiss & Co. have constructed a new kind of duck-bill speculum, which holds itself in position while the practitioner is exploring or operating. (See woodcut, p. 226.)

Turning in Contracted Pelvis.—The truth of the proposition that "The head will come through the pelvis more easily if drawn through base first than if by crown first," becomes only more evident by the results of further experience. The accoucheur may fail to extract a head by the forceps, when, if he turns the child, it will slip through with ease. If the child passes more easily, it follows that turning in these cases offers a better chance of life than the forceps. (Dr. R. Barnes, p. 234.)

Turning when the Uterus is firmly contracted upon the child.—In all dorso-anterior positions, lay the patient on her left side; pass your left hand into the uterus—it will pass most easily along the curve of the sacrum and the child's abdomen; *your right hand is passed between the mother's thighs to support the uterus externally.* In the case of *abdomino-anterior positions, lay the patient on her back, and you may introduce your right hand, using the left hand to support the uterus externally.* If the patient is supported in lithotomy position, you can thus manipulate without straining or twisting your arms or body. But it is equally easy to use the left hand internally if the patient is on her back, so that the exception is only indicated to suit those who have more skill and confidence with the right hand. (Dr. R. Barnes, p. 231.)

Uterine Disease.—*Carbolic Acid.*—Carbolic acid is an excellent local application in the same class of cases of uterine disease which are ordinarily treated by the application of solution of nitrate of silver. It is applied in the same manner as the latter, with the precaution of being careful not to allow the acid to touch the vaginal mucous membrane. As a caustic it occupies an intermediate position between nitrate of silver and the more powerful corrosive caustics. More energetic than it, it is at the same time free from the danger to neighbouring structures which attend the use of the more potent caustics. Although its action does not penetrate below the diseased surface, it possesses great power of changing the vitality of tissues, and produces rapid cicatrization, dissipates inflammation and hypertrophy, and relieves pain. (Dr. D. L. Roberts, p. 247.)

Uterine Hemorrhage.—Digitalis if given in full doses induces violent uterine contraction, and checks uterine hemorrhage. Its action in this particular is permanent, and probably depends upon its causing contraction of the capillaries. (Dr. Dickenson and Dr. Reith, p. 75.)

Vaginal Atresia.—Closure of the vagina, not amounting to an imperforate condition, should be treated by dilatation by tents. An illustrative case by Dr. Murray, of Newcastle, will be found at p. 244.

MISCELLANEA.

ALCOHOL.—*Effect on the Tissues.*—It is remarkable how many morbid processes resemble those which naturally take place in advancing age, and thus a disease will, by its effects, add so many years to a person's life. This is particularly well illustrated by the effects of drunkenness on the tissues, all of which are liable to more or less degeneration. We may have by an increase of the fibrous or connective tissues, a cirrhosis of the liver, a Bright's kidney, or a so-called chronic pneumonia. Fatty degenerations are perhaps more common than fibrous, and thus death by diseased heart is very frequent. The effects on the brain are however the most striking, the convolutions becoming shrunken and the interspaces being filled with water, in fact the brain of second childhood. (Dr. S. Wilks, p. 48.)

ANIMAL VACCINATION.—It is not necessary in out of the way parts of the world to keep up the standard of vaccine virus by importations from England or other parts of Europe. All that is necessary is to inoculate a cow by two inoculations on either side of an udder. Several superficial incisions, or rather scratches, should be made, on the soft skin between the udder and the teat, choosing a part free from hairs, and unaffected by the slight cracks which appear to attack this locality. Lymph may be drawn from the pustules just before they are ripe, by means of capillary tubes. (Mr. W. H. Stone, p. 267.)

ARSENIC.—As a poison the action of arsenic is depressing in the extreme; as a medicine it is tonic and invigorating, excites moderately the action of the heart and arteries, quickens the appetite, promotes digestion, often cures intermittents, and has been known to cure epilepsy. After it has been taken for a period of two weeks or more, there occurs a sense of warmth in the extremities, and a general feeling of improved health and invigoration. Some patients become plump under such a course, and thus feel in high spirits, and are conscious of an improved appetite. After a period of nine months the epithelial scales of the palms of the hands and the soles of the feet become, in some cases, slightly thickened or corny, and in persons of fair complexion a slight scurfiness of the skin in parts protected by the dress occurs. This account is given from an average of fifteen thousand cases, some of whom took the medicine continuously for seven years. Arsenic is not a cumulative remedy. (Mr. T. Hunt, p. 212.)

BROMIDE OF MERCURY.—A less dose of bromide of mercury is generally required than of calomel, and it acts more agreeably and effectually both as a cholagogue and purgative, without the depressing results so often observed to follow the exhibition of calomel. It is useful in promoting the absorption of hypertrophied glandular and other morbid tissue with less constitutional disturbance than the chloride. It may frequently be administered with benefit in cases of biliary congestion of the liver, in chronic hepatitis with enlargement, and in those skin diseases which yield best to the influence of mercury. (Dr. P. Smith, p. 265.)

NITROUS OXIDE AS AN ANÆSTHETIC.—Nitrous oxide will probably come into more general use as an anæsthetic. It may be obtained (of Mr. Barth, 26 Duke-street, Bloomsbury square) in small wrought-iron bottles, containing fifteen gallons of compressed gas, which can be drawn off in any quantity for immediate use. It may easily be administered from an india-rubber bag with an elastic tube, which can be attached to the ordinary mouthpiece connected with the late Dr. Snow's chloroform-inhaler. (Mr. W. A. N. Cattlin, p. 264.)

RELATION OF FOOD TO WORK.—If the work to be performed is uniform and continuous, farinaceous and fatty food is required; if it be severe, but for a short period, animal food in considerable quantity is demanded. The preference among mankind for the suitable kind of diet is instinctive. Thus the Lancashire labourer uses fat and flour, whilst the American Indian is almost purely carnivorous. The Cornish miner who feeds on dough and fat, and does his work well on that, finds himself greatly distressed by the climb-

ing of the ladders at the end of his day's work. If he took more meat this would probably not be the case. (Prof. Haughton, p. 19.)

SNAKE-BITE.—*Arsenic.*—The use of arsenic in cases of snake-bite, as recommended by the author, in the second volume of the Medico-Chirurgical Transactions, has not had the attention it deserved. His plan was to administer two drachms of liquor arsenicalis, equal to one grain of arsenic, with ten minims of laudanum, and an ounce and a half of peppermint water, in combination with half an ounce of lime-juice every half-hour for three or four hours; at the same time ordering a cathartic glyster every hour; and after paring the edges of the wound, fomenting it, and then applying a liniment, consisting of spirits of turpentine, liquor ammoniæ, and olive oil. In three or four hours purging was established and the arsenic was stopped. (Mr. Ireland, p. 263.)

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THE

RETROSPECT

OF

PRACTICAL MEDICINE AND SURGERY,

BEING

A Half-Yearly Journal,

CONTAINING A RETROSPECTIVE VIEW OF EVERY DISCOVERY AND PRACTICAL IMPROVEMENT IN THE MEDICAL SCIENCES.

EDITED BY

W. BRAITHWAITE, M. D.,

LATE LECTURER ON MIDWIFERY AND THE DISEASES OF WOMEN AND CHILDREN AT THE LEEDS SCHOOL OF MEDICINE, ETC.,

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PRACTICAL MEDICINE,

&c., &c.

DISEASES AFFECTING THE SYSTEM GENERALLY.

1.—ON THE LIMITS OF ALCOHOLIC STIMULATION IN ACUTE DISEASE.

By Dr. W. T. Gairdner, Professor of Practice of Medicine in the University of Glasgow.

[Dr. Gairdner considers that the assumption has been made unduly, without proof, to the effect that alcohol not only *is* a food in the ordinary sense of the term, but that it is *the only* food that can be relied on to support the system in many states of disease.]

The root of error, as I believe—the opinion mainly responsible for the extreme lengths to which Dr. Todd and others have carried alcoholic stimulation—is to be found in the undue assumption that alcohol is not only a real food (which, hypothetically, I at least do not deny), but that it is *the* food, of all others, which is to be chiefly relied upon for supplying the material of repair in fevers; thus compensating the waste, and averting the functional exhaustion, characteristic of most acute diseases.

This doctrine I firmly believe to be erroneous; and if erroneous, it must not, in the great interests of humanity, be allowed indefinitely to shelter itself under the authority of great names, or to take refuge in the theoretical confusion which may be raised around it, in the present unsettled state of the physiological question. I shall venture, therefore, here to state the opposite doctrine in as precise terms as the nature of the case admits, viz.: that alcohol, *per se* (that is, apart from the other ingredients present in some stimulating liquors), is not in any sense a fitting material to be chiefly relied on for the repair of the textures in fever; that even admitting the doubtful hypothesis that alcohol may under certain circumstances act as a true reparative material, its practical utility in this direction is very strictly and even narrowly circumscribed by the stimulating or medicinal, narcotic, and ultimately poisonous, action which it always exerts upon the nervous system when given in sufficiently high doses; that in ordinary medical practice we cannot, as a rule, secure any considerable amount of the supposed *feeding* action of alcohol without a certain amount of this medicinal and poisonous action; and that the proper use of the stronger alcoholic liquors in acute disease is, therefore, therapeutic, and not properly dietetic.

Now, in order to bring the issue in the matter before us into the clearest possible shape, I shall maintain, as a doctrine based upon experience, that "alcoholic food," so called, is not only a bad and defective form of nourishment in most cases of fever, but (when used in quantity and continuously) a very positively injurious and disastrous one, inasmuch as it tends invariably, in the high doses prescribed by Dr. Todd and others, to destroy the susceptibility of the system for other and more natural food, to disturb the power of assimilation, to retard the elimination of effete matters from the blood, and by poisoning the nervous system, to render the patient more or less insensible to the natural wants of the exhausted body.

The whole drift of the argument of Dr. Todd's book is, that without such doses of alcohol as he describes it is impossible to pass safely through a fever of considerable intensity. Hence the alcohol (as he remarks elsewhere) must on no account be stopped, even though its use should appear to lead to flushing, or to increased delirium, or to coma; for it is more likely that the dose is too small than too large, and in any case, he remarks, "it is much better to err on the side of over-stimulation than not to give enough" (p. 130). Hence, also, the repeated cautions "against the *morbid* fear of over-stimulation, which leads many to adopt an opposite or vacillating course, and to allow their patients to die from exhaustion." "I must tell you, *in limine*," he writes, "that it is far more dangerous to diminish or withdraw alcohol than to give too much" (p. 484). Again—"I cannot too strongly impress upon you that, to do good with stimulants, you must use them early, with care and watchfulness, in very definite quantities, and not in a vacillating or timid manner. . . . The harm which they do (in disease) is grossly and unfairly exaggerated, and always due to the slovenly administration of them" (p. 270).

These statements are certainly entitled to the credit of being the fruit of a very strong and undoubting conviction. But are they well founded in fact? Is the large use of the stronger alcoholic liquors in acute disease so necessary? Are the dangers of their injudicious use to be found always, and alone, on the side of *under*-stimulation?

To both these inquiries I am led by experience to give a negative answer; and as, even apart from all theory, the statement of the facts is important, I shall ask your permission to place some of them before you in an extremely condensed form, referring to previous communications for the details of evidence.

As regards epidemic fever in the first place, I believe I have unassailably demonstrated that its treatment may be successfully conducted with allowances, even in the very worst causes, of stimulants far less in quantity, and far less continuously given, than those on which Dr. Todd was accustomed to insist from day to day (as above shown), in the face of quite apparent symptoms of alcoholic coma, under the mistaken idea that life could not be preserved without going to the very verge of "over-stimulation." In a rather minutely detailed narrative of two months' experience in the Glasgow Fever Hospital, I have accurately recorded 68 cases of febrile disease (chiefly typhus fever) in males and 58 cases in females, in the precise order in which they occurred, omitting no single case (even when sent to the hospital actually moribund) that crossed the threshold of the ward; and yet I have calculated that the *whole of the* 68 *male cases* consumed only 328 ounces of wine and 401 ounces of whiskey, being, in all probability, a less quantity of alcohol than was administered to the *one* young girl Copstock, whose case is mentioned above. The mortality of these 68 cases was only 6—*i.e.*, less than one in eleven, one of the deaths being in a case of pneumonia, one in enteric fever, the rest in typhus. The number of these cases is of course quite too small for a statistical analysis of any value, and it is not my intention to insist upon this at present, further than to say that all the available evidence goes to show that the mortality was, as compared with almost any similarly and equally exactly observed series of cases, remarkably small, and that Dr. Todd's results, so far as they are known, were in fact very inferior to mine in respect of *numerical* success.

It must be stated that in 49 out of the 68 males, and 34 out of the 58 females, there were absolutely no stimulants administered; and in many of the remaining instances the quantities given were so small as to be purely experimental, but at the same time such as to show that I did not, from any preconceived theory, or to carry out a dogma, willingly omit any reasonable opportunity of observing if stimulation appeared to do good. The details of the fatal cases leave it, of course, open to be argued that some of them might possibly have been saved by a larger administration of stimulants; but, on the other hand, I was quite satisfied at the time, and am equally satisfied now, that if on this side there was a possible error, there was also, to a

certain amount, an unnecessary, perhaps even injurious, administration of them to some of the patients who recovered. To those who recoil distrustfully from numerical arguments, I would recommend the study of these cases in detail. I believe that such a study of them will lead to the conviction that, under a habitual practice of high stimulation, the general result could scarcely have been better on the whole, while there is a good deal of reason to suppose that it might have been very much worse. Yet I should be sorry if any one drew the inference that I consider these cases as examples of a perfected or model treatment in all respects, or even that I look upon them as entirely conclusive with regard to the exact quantities of alcohol that may be most beneficially administered in fever. The only conclusion I wish to draw from them is, that the habitual, or continuous, or *alimentary* use of alcohol in fever is to be deprecated as at least unnecessary, and even to be suspected as possibly injurious.

On commencing hospital practice in Glasgow in the end of 1862, I found another great epidemic of fever already in progress. Four physicians were very soon at work in the fever wards; and I became aware, through various suggestive hints, that the *ratio* of stimulation I had insensibly adopted, after so many years of varied experience, was considered unusual, and even doubtfully orthodox, by some of the most respected of my senior colleagues. On one occasion it was pointed out to me, from the wine and spirit rolls of the house, that in the other wards of the fever hospital, at a particular date, fully six times as much wine and whisky were administered *per patient* as in mine; or rather, to state the matter more exactly, the wards might be considered as equally divided between two physicians who adopted a system of pretty high stimulation, and two others who followed a practice of very great moderation in this respect. Under these circumstances it became a simple duty to inquire into results, and to secure, in so far as it could be done without invidious personal reflections, that the lessons of experience should be made as plain as the nature of the facts permitted. I accordingly gave the necessary instructions to my assistants, and I had the satisfaction of having them followed out with the most minute accuracy and faithfulness in detail. The result was a triple series of cases, amounting to 595 in all, which were analysed and commented on in the Lancet, March 12, 1864.

It is difficult to state here in a condensed form what I believe to be the just conclusions from this experiment, without laying them open to some more or less plausible objections; but the following facts are, I believe, unquestionable, and will serve to give an idea of the inferences fairly deducible from the whole.

In the year 1861 (commencement of the epidemic), before I had left Edinburgh, the recorded mortality of *typhus* over the whole of the Fever wards of the Glasgow Royal Infirmary was 18·86 per cent. In the year 1862 it was 16.72 per cent. In both these years the ratio of stimulation practised was rather high especially as regards the amount of wine; the proportion, however, cannot be exactly ascertained for the typhus cases separately, owing to the deficiency of data. In December, 1862, I became a physician of the Glasgow Royal Infirmary, but of course the statistics of that year can scarcely include any cases of mine treated to a termination.

In the years 1863 and 1864 the experiment above alluded to took place, and the number of cases biased towards a lower scale of stimulation amounted, I believe, to about one-half of those under treatment. The mortality of typhus fever as officially rendered in the books for the whole hospital, was:—

In 1863, . . .	13·91 per cent.
In 1864, . . .	13·16 "

In the succeeding years (under yet a different arrangement) the mortality was as follows:—

In 1865, . . .	15·81 per cent.
" 1866, ...	16·4 "
" 1867, . . .	16·95 "

It has to be added that during the years 1863 and 1864, the mortality at

all ages of the cases under my own personal charge (a few cases being omitted in summer, when the change of assistants for a time threw the returns into a slight degree of confusion) was as follows :—

First series,	11·1	per cent.
Second series,	19·0	"
Third series,	10 3	"
Fourth series,	9·3	"
Total (amounting to 703 cases),	11·5	"

It thus appears that a total number of 703 cases, representing a very low scale (possibly, indeed, too low a scale) of stimulation, gives a mortality of 11·5 per cent., while the mortality from typhus in the adjacent years, in the same hospital, and during the same epidemic, is from 15·81 to 18·86 per cent.

But by taking special account of the cases of the young (up to fifteenth and sixteenth year), the following very interesting results are obtained :—

In the two years of comparatively high stimulation (1861 and 1862), the mortality among the young in typhus in the fever wards of Glasgow Royal Infirmary was 3½ per cent.

In the cases treated by me in 1863 and 1864, and corresponding to the four series of 703 cases at all ages, above mentioned, there were in all 210 cases (taking in those recorded in the Glasgow Medical Journal) below the fifteenth or the sixteenth year of age; and among all these cases it is doubtful whether more than one was a death from typhus. It is better not to reduce this result to a per centage, however, as I believe it must be regarded, under any view of the facts, as a piece of surprising good fortune. But when we find that the mortality of children in fever in Dr. Todd's hospital practice was certainly considerable, and out of all comparison higher than this (making every possible allowance for imperfections of the record), it is difficult to resist the conclusion that to the young, at all events, the administration of alcoholic stimulants in high doses in fever is fraught with a very serious danger from "over-stimulation." For although there are no cases of children in fever recorded with details in Dr. Todd's published works, private information leaves no doubt on my mind that his method of administration, as above described, was extended to the most tender ages, as well as to the most delicate and abstemious individuals of adult age.

I have had most ample evidence before me, in consultations, that much injury—often, I believe, fatal injury—has resulted from the inordinate administration of stimulants in acute diseases, especially to the young; and therefore it has been not from any love of innovation or of paradox, but rather from a deep sense of personal responsibility, and under a most serious conviction of the importance of the subject, that I have been led gradually to the conclusions adopted in this paper.

These conclusions, except as regards typhus fever, cannot even now be stated in any very strict or definite form; but the fair analogies deducible from the facts, and the gradually and insensibly acquired experience gained from watching individual cases of general acute disease, concur in rendering probable most of the following inferences :—

1. The importance of proper nourishment and sustenance in febrile cases is very great, and nothing can be worse than the old, and now happily exploded, system of depletion and starvation. But it is not less an error to conceive of alcoholic stimulation as a proper substitute, in such cases, for ordinary food. Milk is the normal food of most persons in acute disease, and there are very few persons, even in severe fevers, who cannot receive it to the full extent of their powers of assimilation; but most of the other simpler elements of an ordinary diet may be employed with advantage in particular cases. Beef-tea (so much favored by Dr. Todd, in conjunction with alcohol) is of very inferior nutritive value, and therefore of altogether secondary importance to milk; and further, beef-tea very often disagrees with the stomach when milk and farinacea can be freely taken. In enteric cases

beef-tea has been found occasionally to increase the diarrhœa, and it is usually to be avoided, or very cautiously given, on that account.

2. The proper mode of administering food in cases of febrile disease is to imitate, as closely as the condition of the patient admits, the usual practice in health; and most patients, even in severe fevers, retain so much of the habits and functions of health as to enable them to digest a good deal of simple food, conveyed into the stomach at proper intervals, and with sufficient intervals of rest to allow of a return of the desire for food in some degree before again giving it. To give brandy and beef-tea every hour or half-hour, and to continue this practice for days and nights together, even wakening up the patient (as is recommended by Dr. Todd) in order to give him his food and stimulant, is the surest of all ways to destroy whatever remains of natural appetite, and to derange altogether the already much weakened function of assimilation. In a few almost desperate cases, where the power of swallowing is nearly lost, it may be advisable to give food at much more frequent intervals during waking hours than in other cases; but rarely, if ever, to disturb the patient when asleep.

3. The proper use of alcoholic stimulants in cases of acute disease is nearly the same as in other cases, or in comparative health—viz., to quicken and develop the appetite for real food, and the power of assimilating it. The proper and normal time, therefore, for giving these stimulants in fevers is *along with the food—i.e.*, at the *regular* meal times, and *not* during the intervals; except in cases where the nervous system is much disordered, and where a moderate dose of the stronger stimulants may sometimes be of great use in procuring sleep.

4. The proper dose of alcoholic stimulant, and also the proper kind of stimulant to give in each case, is subject to considerations derived much more from the age, sex, and previous habits of the patient than from the severity or character of the fever. It is an error to suppose that patients affected with very severe symptoms of acute disease are capable of tolerating *indefinitely* greater amounts of alcoholic liquors than can be given in milder cases, or to the same persons in health. It is even probable that in some cases the susceptibility to over-stimulation is greater in fevers than it is in health. At all events, it is usually a practical error to carry stimulation much beyond the line above generally indicated.

5. In most cases of young persons, and in very many of adults not accustomed to the daily or frequent use of alcoholic liquors, these ought not to be given in quantity, or even at all, without the most clear evidence of their being really required. The effect of each dose should be carefully watched, and it is *almost always safer to withdraw the stimulant entirely for a period of hours than to run the risk of over-stimulation.* It is almost certain, from facts already observed, that in young persons the mortality of fevers is greatly increased by the *continuous* administration of alcoholic stimulants, even when the more striking or obvious symptoms of over-stimulation do not become apparent.

6. The effect of stimulants moderately and judiciously used in certain critical states of acute disease is to restore and refresh the patient, to favour natural sleep, to lower the rate of the pulse, to quicken the appetite, and increase the power of assimilating food. The effect of stimulants continuously or immoderately given is to destroy the appetite for food, to produce torpor, to give rise to more or less profuse sweating, to dry the tongue, to prolong the febrile debility, and to protract the crisis. There is reason to think that in typhus fever the normal crisis may be delayed for several days by the constant administration of brandy, after the manner recommended by Dr. Todd.

7. In the self-limited fevers, in which the phenomena of the crisis are well known, and the course of the disease may be easily defined and anticipated, it is usually requisite to be very sparing of stimulants in what may be termed *normal* cases, because in these the disease is to be recognised as running a definite course; while any considerable excess has a tendency to convert the case into an abnormal one, and to postpone the crisis. It has already been

sufficiently indicated that, in the opinion of the author of this communication, alcoholic stimulants rank with drugs and medicines rather than with food. The same minute knowledge of the course of fevers which induces a well-educated modern practitioner to abstain from constantly drugging his patient will also, in most cases, lead him to abstain from stimulation. And, on the whole, it may be confidently anticipated, as a result of improved consideration given to the subject, that the profuse and continuous administration of alcoholic stimulants, with a view to alimentation in acute disease, will ere long be abandoned as inconsistent with an enlightened physiology and a sound practice. While stimulants will continue to be prescribed to the sick, on the same principles, and for the same ends as causes them frequently to be taken with refreshing and beneficial results in comparative health, their function in acute disease will more and more come to be recognised as a strictly limited one; so that *continuous* administration of them, or administration carried up to such doses as 24, 36, and 48 ozs. in the twenty-four hours, will be abandoned as involving an error in principle, and a serious danger to life in actual practice.

8. A subordinate, though still very important consideration, bearing upon such profuse and continuous stimulation as is above referred to, is that such liberal doses of wine and spirits given habitually under medical advice, tend to give a wrong bias to public opinion, and (even apart from the grave moral consequences arising from the abuses of alcoholic liquors) to involve the whole medical practice of the country in a system of unnecessary, and therefore wasteful expenditure. It is as nearly as possible a demonstrated fact, that much of what is spent in wines and spirits for the sick in hospitals (and therefore probably also in private practice) is unnecessarily, if not injuriously, spent. Typhus fever, as it occurs in Glasgow, almost always among the poor, and often among the most ill-nourished, debilitated and, dissipated classes, is the very type of a disease which would appear to require the highest doses, and the most frequent and liberal administration, of alcoholic stimulants. Yet it has been clearly shown that typhus fever in Glasgow may be *so treated as to have a diminished mortality*, with the aid simply of milk diet and careful nursing; alcoholic stimulation being deliberately maintained upon a scale so low as to make it quite an exceptional, and therefore purely therapeutic, agent. In the City of Glasgow Fever Hospital, the careful and most scrupulously watched experiments of Dr. J. B. Russell have led almost insensibly, and without any fixed plan, but *without an increased success as regards results*, to lower from year and year the scale of stimulation on the whole, until last year the calculated amount of absolute alcohol administered in the form of wines and spirits to each patient, on an average, during each day of the treatment, was less than *one-sixth of an ounce* (0·1630 oz.), and the expense of this quantity was little more than three farthings; while the entire bill for wines and spirits consumed, during a year in which 969 cases of febrile disease (mostly typhus) were under treatment, was £34 5s. 6d. The mortality of typhus (including all the cases admitted moribund) during the same period was in this hospital only 9·05 per cent.; being the lowest ratio of mortality, I suspect, that has ever been attained in the treatment of so large a number as nearly a thousand cases, accurately distinguished as genuine typhus.—*Glasgow Med. Journal, Nov.* 1868, *p.* 15.

2.—SULPHUROUS ACID IN TYPHOID.

Sulphurous acid in typhoid is highly praised by Dr. R. Hamilton, who has given it in large doses. To children he gave it in drachm doses every four hours, and to adults in three drachm doses. He regards it "as in reality but the internal administration of sulphur!"—*Practitioner, Feb.* 1869, *p.* 116.

3.—THE PREVENTIVE TREATMENT OF SCARLET FEVER.

By Dr. Peter Hood, London.

In the ordinary run of cases the first symptom usually complained of is headache, next soreness and swelling of the throat, followed by vomiting—and we find that the aforementioned symptoms are relieved by the vomiting taking place. The healthy action of the liver is interfered with, and the bile, instead of taking its natural course, finds its way into the stomach, and is invariably found in the materials ejected. Hence the importance of giving an emetic at the onset of the fever, if vomiting have not occurred. We may to a certainty judge, for our guidance, of the presence of bile in the stomach by the appearance of the tongue; if this member be covered, or only partially so, with a brown fur, bile will be thrown up as soon as the act of vomiting occurs.

We sometimes meet with a case of continuous vomiting, attended with extreme irritability of stomach; this condition, if judiciously managed, is not fraught with danger, as there is more to be apprehended from the absence of vomiting that when it is an excess. The perverted course of the bile points to a defect existing in the liver, which defect is one of congestion. Here, again, we are called upon to assist nature in relieving this important organ; no medicine operates so beneficially in this case as a dose of calomel and scammony. And if we take the appearance of the tongue as our guide throughout the whole period of the fever, and when it is otherwise than perfectly clean administer gentle alterative medicines to sustain the healthy action of the liver, we shall most effectually prevent dropsy from occurring, and avoid deafness and all the other sequelæ attendant on this disease.

When the stomach has been relieved by vomiting, either by the operation of nature or art, and the liver and bowels also by the administration of an efficient dose of medicine, it is then the proper time to avail ourselves of the antiseptic property of quinine, *which drug is, according to my experience, as powerful in destroying the scarlatinal germ as it is potent in the cure of ague.* I do not hesitate to say that, if the previous injunctions as to the emetic and purgative are attended to, any medical man who has never before employed this medicine in the treatment of scarlet fever, will never employ any other when he witnesses the gratifying progress of a case only twenty-four hours after using it. He will find the pulse diminished in frequency, the soreness of throat and difficulty of swallowing scarcely complained of, obviating all necessity for the use of gargles, sponging, caustics, etc., the heat of skin most sensibly decreased, and the restlessness, frequently so distressing a symptom, succeeded by a calm composure. In the worst forms of scarlet fever, in which the blood of the patient is in a dyscrastic state, indicated by virulent coryza, discharges from the mouth, eyes, and ears, owing to the disintegration of the mucose surfaces, it is imperative to administer iron with the quinine, and suitable doses of the tincture of sesquichloride of iron, or of the sulphate of iron, should be diligently persevered with; at the same time paying strict attention to procuring a daily alvine evacuation.

I must refer to one other subject connected with the treatment of scarlet fever, which I regard almost as important as the use of quinine itself. This is the disinfection of the sick room by the employment of chlorine; and here I must differ from what Dr. Budd's experience has led him to say on this subject. I quote the passage to which I refer:—"Many medical men are in the habit of fumigating the sick room, either constantly or several times a day, with chlorine or sulphurous acid pending the whole course of the fever. There can be no objection to this measure, but I do not myself attach much importance to it. Experience of the largest and most decisive kind has shown that chlorine—and I believe the observation applies equally to the other chemical agent—in the degree of atmospheric impregnation respirable by man, has no appreciable influence in preventing the spread of infectious disorders." Dr. Budd has not told us in what manner he has employed disinfecting agents, chlorine more especially, to enable us to judge whether his method of using them were likely to be efficient or not.

My experience of the beneficial effects of a free use of chlorine is directly opposed to Dr. Budd's views; and I am able to state from my own observation that, if this gas be properly used in the sick room of the patient, *the contagion of scarlet fever will be confined to that room.* My method of using it is as follows. I direct large coarse towels to be saturated with a solution of chloride of lime, and hung over the backs of chairs, and a sheet to be hung in front of the bed-room door. We may judge of the quantity required for disinfecting the room by smell and taste on going into it. This process should be continued throughout the course of the fever.

I have always found the effect of breathing the chlorine to be most refreshing to the patient and most soothing to the throat; for frequently, when patients have complained of a difficulty in swallowing previously to its being used, directly they have breathed the gas they have exclaimed, "I can breathe much better now."

I could give numerous instances of the power possessed by chlorine in localising the scarlatinal poison. I will confine myself, however, to one as a type of the others; and I select this instance on account of the unusual opportunity I had of watching the progress of the case from the commencement, when it showed signs of being most severe, to its termination. I extract this case from short notes made at the time, giving the treatment employed for the subjugation of the fever.

Two years ago I was on a visit to a family in Scotland, where I stayed three weeks. On the morning after my arrival, the lady of the house came to me in great tribulation and asked me to see her little girl, eight years of age, who, she feared, had scarlet fever. This lady, two years previously, had lost a girl from scarlet fever about the same age, and her second son was very nearly following his sister. The mother told me that the illness of her other children began exactly with the same symptoms as the present little girl had. She had been quite well the day before, but in the evening complained of cold and had a rigor. I learnt that the child had been delirious throughout the night. She complained of intense headache, her throat was very painful, the tonsils were much swollen and of a deep red colour, and she had great difficulty in swallowing. Her eyes were blood-shot, and she had been repeatedly sick. Her skin was burning-hot, and there was a rash all over her body. Pulse 120; tongue very foul, and her breath very fœtid; great restlessness and intense thirst. I first saw her on the 9th of Aug., at 10 a.m. I ordered one grain of calomel, and one grain of James' powder, to be made into a powder with some sugar, one to be given every four hours; a tea-spoonful of the effervescing citrate of magnesia to be given one hour after each powder. Small pieces of ice and iced water to quench the thirst. This was very grateful to the child. The air of the room was impregnated with chlorine in the way described. When I saw her at 7 p.m. the child was better. She had taken three powders. The sickness and headache had left her. Her throat was less sore on swallowing; she having felt almost instant relief from this symptom the moment she breathed the chlorine. She had had several most offensive watery evacuations throughout the day. The rash and heat of skin remained the same. The tongue had quite changed its appearance from the brown colour of the morning, to a red, chalky condition. I ordered the powders to be left off, and no other medicine to be given until the morning, when she was to have a dose of the citrate of magnesia. On August 10th, the rash, which yesterday was of a dingy red, this morning was a vivid scarlet. The burning heat of skin and quickness of pulse remained the same. I ordered her one grain and a half doses of quinine, with ten-drop doses of dilute sulphuric acid, with tincture and syrup of orange peel to be given in water every six hours. Her diet was beef-tea and bread. When I saw her at midnight I heard that she had fallen asleep at 7 p.m., and remained so until that time. On the 11th, the child was in all respects better. She had slept until 3 a.m.; awoke, and fell asleep again. The rash still continued. The pulse was less rapid, the heat of skin less, the throat more comfortable. She felt so well that she wanted to get up and be dressed. The tongue was more furred to-day. I ordered her a dose of scammony and

calomel to be taken at night. On the 12th she was much better. The eruption was paler, the tongue cleaner, the pulse reduced to 95. The result from the powder was a healthy evacuation. On the 13th, the eruption had faded away. The patient was ordered to have a warm bath at night. It is unnecessary to continue the history of this case. The child went on for three weeks upon the same treatment, and never had a bad symptom—taking her quinine every six hours, with an occasional aperient at bed time, with beef-tea for her diet, and a warm bath every second night. Desquamation proceeded most satisfactorily, and at the end of this time her skin had resumed its normal character.

I attribute the short duration of the rash to the effects of the quinine and acid, as ever since I have employed these remedies I have found that the continuance of the rash is rarely beyond three days. On the other hand, I have often observed that, in cases where ammonia or chlorate of potash have formed the basis of treatment, the rash has lasted for a greater number of days

The house in which this child was ill, was full of visitors, children, and servants, yet every one of them escaped the infection of scarlet fever; and I am unable to attribute their immunity from the disease to any other cause than the free use that was made of the disinfecting power of chlorine.—*British Med. Journal, Feb.* 6, 1869, *p.* 118.

4.—PROPHYLAXIS OF SCARLET FEVER.

Mr. Amos Beardsley, of Grange, Lancashire, sends us an important note respecting a method of arresting the spread of scarlatina, which he has found very valuable. When a patient suffers from scarlatina, he is to be washed all over, once or twice a day, with diluted carbolic acid. Mr. Beardsley says that in no case in which he has tried it with the first case in a house has there been any further spread of scarlatina in the family. For example, about a year a ago he had a girl, seven years old, under his care, one of a family of five; she was attacked with well-marked scarlatina, and was immediately ordered to be systematically sponged with carbolic acid—one drachm to a pint of water. Also the rest of the household were desired to put carbolic acid into their washing water. Although there were no means of properly separating the other children from the invalid, none of them took the fever; the one patient was severely ill, and scarlatina was in all the surrounding villages, and in remote parts of the village where the family lived. Mr. Beardsley has now had so much experience as to be convinced that this plan is most useful in preventing the emanation of contagious influence from patients, especially during the desquamating stage. We shall hope to give a more extended account of the results he has obtained on a future occasion. —*Practitioner, Feb.* 1869, *p.* 111.

5.—DIGITALIS IN SCARLET FEVER.

By Dr. Sydney Fennell, Llandaff.

For some years past it has been my custom to prescribe for my scarlet fever patients tincture of digitalis, in conjunction with nitric ether and nitrate of potass. The success of this treatment justifies me in recommending others to adopt it, now that the disease is again ravaging the country.

Of course, the ordinary action of digitalis in controlling the force of the heart's beat is well known; but may it not have also some power over that network of nerves embracing the whole arterial system, from the aorta to the extremities? I think so, from the peculiar soft, wave-like feeling imparted to the finger by the pulse at the wrist after a few full doses of the drug. And on this supposition I based my treatment of scarlet fever by digitalis; for whatever would reduce overaction in the arterial capillaries would lessen inflammation. Digitalis will do this without reducing the

general strength, as antimony, venesection, &c., certainly do. I will not go so far as to assert that it is capable of curing inflammations of internal organs, such as the lungs, &c.; yet even in these it is extremely useful in controlling vascular action, and, when administered early in the fever, the inflammatory action in the glands of the neck subsides gradually, the fever leaves the patient in the usual time, desquamation is very slight, and the chances of chronic nephritis are reduced to a minimum. I will not say the infectious character of the disease is destroyed, yet I can confidently assert its power is lessened.

No one would suspect, if suppuration of the glands had commenced, that digitalis would prevent the formation of an abscess; yet I find, from my experience of these cases, the abscesses much circumscribed, which I attribute to the use of this drug.

I was surprised to find infants of about a month old tolerate so much as five drops of the tincture for a dose (though one drop is generally sufficient), given consecutively for three days, every three or four hours, with advantage; auscultation giving the usual number of beats (about eighty) in the cases where the larger dose was given.—*Lancet, Jan.* 23, 1869, *p.* 143.

6.—CARBOLIC ACID IN SCARLATINA, MEASLES, AND SMALL-POX.

By Dr. Alexander Keith, Normanby.

[The administration of carbolic acid internally is, we think, a new idea.]

During the last six months I have used the carbolic acid in fever, scarlatina, measles, and small-pox, with, I think, some success. I have during that period given it in 600 cases internally. Of these only five have died, and those from complication after, produced by bad nursing. I may state that, during the said time, I have had no less than 1500 cases in all. The deaths, including the five above mentioned, are twelve. The other cases were treated in the usual way, with salines, chlorate of potass, &c.

Without going further into detail, allow me to give you the "physiological effects" in few words. 1st, it produces profuse perspiration; 2nd, it rapidly lowers the pulse, so much so, that in twenty-four hours the pulse will fall from 120 to 60—skin cool and moist, with subsidence of fever; 3rd, the tongue, after the same time, will be clean, moist, and, in scarlatina, the soreness of throat much diminished; 4th, after its use for the same time, the appetite continues to improve; 5th, I have found it more useful at an early stage of the disease, although, given afterwards, it very much modifies the symptoms, and carries the patient through the different stages of the disease much more quickly than any other treatment that I have seen; 6th, in some cases the urine appears smoky, as if fine charcoal had been used with it. These are the principal points I have observed from its use. I could give you numbers of cases, but I will at present content myself with the foregoing statement, and simply add the formula in which I give it—carbolic acid and acetic acid, of each one drachm to one drachm and a half; tincture of opium, one drachm; chloric ether, one drachm; water, to eight ounces. I give a tablespoonful of this mixture every four hours, until the fever, &c., has subsided. Then the after-treatment is simple. I find that, after the first dose, the patients rather like it than otherwise.—*Lancet, Jan.* 23, 1869, *p.* 143.

7.—REMARKS ON THE NATURAL HISTORY OF RHEUMATIC FEVER.

By Dr. William W. Gull, and Dr. Henry G. Sutton.

[This article is an abstract of a paper read before the Royal Medical and Chirurgical Society.]

The authors are desirous of bringing under the notice of the profession a

few more cases of rheumatic fever which have been treated by mint water, or, in other words, which have been allowed to run their natural course. They moreover desire to point out what appears to be the natural course of rheumatic fever with reference to the heart, and to show in what proportion of cases the heart became involved when rheumatic fever was treated by mint water. Lastly, to consider if there is any evidence to prove that the heart is more frequently involved when rheumatic fever is treated by mint water, or when treated by alkalies, by lemon-juice, or by blisters. This paper is based on twenty-five cases of rheumatic fever, twelve of which occurred in Guy's Hospital, most of them under the care of Dr. Gull, and thirteen occurred in the London Hospital, under the care of Dr. H. G. Sutton. The particulars of the twelve cases have been already recorded in the Guy's Hospital Reports, and the remaining thirteen cases are recorded in the present communication to the Society. Of these twenty-five cases, eighteen were females and seven were males. The average age of the patients was nineteen years. All the patients were suffering from their first attack of rheumatic fever, and the disease was well marked. The temperature of the body during the acute symptoms reached in some cases 104° and 103°; in other patients it was 101° and 102°. Taking an average of all these cases, the temperature was about 102° during the acute stage. The average duration of the acute symptoms, as estimated by the thermometer and general symptoms, was ten days. Taking all the cases that have been recorded by the authors, the average duration was 9·1 days. The total duration of the acute symptoms from their commencement, including the time the patients were ill before coming into the hospital, to their cessation, was on an average seventeen days. The authors next proceed to inquire if the duration of rheumatic fever is longer when treated on the expectant plan, or when treated by drugs; and they considered that no one plan of treatment has any great advantage as regards shortening the duration of the disease. Drs. Gull and Sutton agree with Dr. Barclay in considering that we are not yet in a position to say that alkalies exercise any influence in curtailing the duration of the disease. They are also of the same opinion respecting lemon-juice. With regard to Dr. Herbert Davies's blister treatment, they remark it relieves very much the pain and sufferings of the patients in some cases; but it does not appear to curtail the rheumatic process. And the authors remark, "Our cases appear to teach that the rheumatic process runs its course under the expectant treatment as favourably as under the treatment by drugs." Drs. Gull and Sutton next proceed to inquire what evidence there is to show that the drug treatment prevents the heart becoming diseased, and they give a detailed account of the state of the heart in their twenty-five cases. Every one of these twenty-five patients were suffering from their first attack of rheumatic fever, and twelve of the number had organic disease of the heart when admitted into the hospital; two had some, but not very well-marked, evidence of organic disease of the heart when admitted; and in eleven there was no heart disease on admission. No organic disease of the heart supervened while under treatment and the heart was healthy when these eleven patients left the hospital. They remark the experience gained in these cases of rheumatic fever, which were allowed to run their natural course uninfluenced by drugs, tends to prove that, if patients are admitted into the hospital suffering from a first attack of rheumatic fever, and the heart is not diseased on admission, it will very rarely become organically diseased while patients are under treatment. The opinions of Drs. Garrod, Dickinson, Herbert Davies, Geo. Owen Rees, and Basham are then quoted to show that the heart did not, or very rarely did, become diseased when rheumatic fever was treated in the hospital by full doses of alkali, by blisters, by lemon-juice, or by nitrate of potash, and they observe: "It appears to us that there is not sufficient evidence to prove that any of the advocated systems of treatment have power to prevent the heart becoming diseased. In concluding that the treatment has prevented the heart becoming diseased, we have overlooked the fact that there might be no tendency at the time the patients were under treatment for the heart to become diseased, and our cases show that the good results which

have been attributed to the influence of the remedies also occurred when no special remedies were used. Our cases, therefore, tend to teach that these good results were due, not to the drugs, but to the natural course of the disease." The authors then endeavour to show that when the heart becomes diseased in rheumatic fever, it does so at an early stage of the disease; and if it does not become diseased during the first week of the rheumatic fever, it rarely does so afterwards; and they give abstracts from twenty-two cases of rheumatic fever to demonstrate this.

Drs. Gull and Sutton's conclusions are as follows:—

That when the patient's heart was healthy on admission into the hospital, it was very rare for it to become organically diseased while the patients were under treatment by mint water—or, in other words, when the rheumatic fever was allowed to run its natural course.

That the evidence before the profession shows that the heart very rarely became diseased while patients were under treatment in the hospitals, and that this was the case when patients were treated by alkalies, lemon-juice, or by blisters to the joints.

That there is not sufficient evidence before the profession to prove that any of the advocated remedies have power to prevent the heart becoming diseased.

That in rheumatic fever the tendency is for the heart to become diseased during the first few days of the fever; and should it escape the early days of the disease, there is each day a lessening tendency to its implication. Hence the cases would appear to show that, if at the end of the first week of the rheumatic fever the heart is free from disease, then there is little or no tendency for it to become diseased during the later weeks.

That the reason why the heart did not become diseased when rheumatic fever was treated by alkalies, blisters and by lemon-juice is to be attributed, not to the influence of the drugs, but to the natural course of the disease; for the patients did not come under treatment until the rheumatic fever had been going on some days, and until the period when the heart was most liable to become diseased had passed over.

The authors conclude by saying: "Hitherto the investigation into the therapeutics of the rheumatic process has been rendered all but valueless by the deficiency in preliminary data. At present, therefore, as regards treatment, our cases seem to show that we are limited to a careful regimen of the patient. Rest, mechanical and physiological—rest in the very outset of the disease. We ought not to wait until the rheumatic process has become well developed in the joints. To regulate the temperature. To moderate excessive skin function by sponging the surface of the body. To allay pain, by placing the patient in an easy position, and sometimes by opiates. To sustain the organic nerve power by light diet, and occasionally by small doses of alcohol. To procure rest by the simplest means, especially avoiding such movements of the body as may excite the circulation. In fine, to place the patient in a physiological state of mean rest, if it may be so termed, of the nervous, the circulatory, the muscular, and digestive systems. To do this fully will often tax all our energies, and require often more consideration than is requisite for prescribing any supposed appropriate drug treatment. We are, therefore, at present advocates of the exactest treatment of the patient under acute rheumatism, though we may doubt the value of so-called specific drugs."—*Lancet, Jan.* 16, 1869, *p.* 102.

8.—THE ALKALINE TREATMENT OF RHEUMATIC FEVER.

By Dr. Henry Wm. Fuller, Senior Physician to St. George's Hospital, and Consulting Physician to the North London Hospital for Consumption.

[It has been asserted by several critics, and those of experience and good opportunities of observation, that rheumatic fever gets well just as quickly without specific treatment, as with. Dr. Fuller disputes the facts upon which these conclusions are based, and shows from their own cases that the natural duration of rheumatic fever is six weeks, and not ten to twenty days as stated

by them. Dr. Fuller gives his own experience as to this mode of treatment in hospital and private practice, and then points out the causes of its failure, when failure apparently followed its use.]

First, what is meant by the "alkaline treatment?" I do not mean the administration of salines or small doses of the alkalies, such as half-drachm doses of the carbonate of potash every four hours; for, in my experience, these remedies so administered exercise absolutely no control, in either shortening the duration of the disease, mitigating the patient's sufferings, or protecting his heart from mischief. Neither do I mean the administration, throughout the attack, of large doses of the alkalies, such as a drachm and a half or two drachms every four hours, for these remedies, so administered, would depress the patient, and might even produce dangerous consequences. Moreover, experience leads me to believe that they certainly would not tend to his recovery. By "the alkaline treatment," I mean a plan of treatment in which alkalies play an important part, but which consists not only in the administration of alkalies, but in the careful regulation of the secretions, the strictest attention to diet, and the administration of tonics, such as quinine and bark, as soon as the patient can bear them. Being convinced that as soon as the system is alkalinized, as shown by the alkalinity of the secretions, a great safeguard is obtained against inflammation of the heart, or of any of the then unaffected joints, my practice is to give not less than an ounce and a half of the alkaline carbonates, either alone or in combination with a vegetable acid, during the first twenty-four hours of treatment. They should be given largely diluted with water, either in effervescence or otherwise, as is the most grateful to the patient. Sometimes the whole quantity of the alkali is ordered to be mixed with three imperial pints of water, and taken as a drink in the twenty-four hours—a form which is often very grateful to the patient—but more commonly two drachms are ordered to be taken in effervescence every three or four hours in combination with an ounce of lemon-juice, or with half a drachm of citric acid dissolved in four ounces of water. At the same time, if the bowels are torpid, ten grains of colocynth and calomel pill are prescribed at bed-time. As soon as the urine, when freshly voided, ceases to show an acid reaction—which is usually the case after twenty-four hours—the quantity of the alkali is diminished by one-half, six drachms only being administered during the succeeding twenty-four hours. At the expiration of that time, if the urine remains alkaline, three drachms only are given in the next twenty-four hours; and on the fourth day, if the urine still shows an alkaline reaction, the form of the medicine is altogether changed. The treatment ceases to be essentially alkaline: either a cinchona draught is ordered to be taken three times a day, containing a scruple or half a drachm of bicarbonate of potash—a little more or a little less, according to the condition of the urine, which should be kept nearly neutral—or three grains of quinine dissolved in lemon-juice is given three times a day in effervescence, with half a drachm of bicarbonate of potash or soda. Throughout the attack an aperient pill is given whenever it is needed, and opium is rarely, very rarely administered—never except under conditions of extreme nervous irritation. The diet is restricted to beef-tea or broth, with soda-water and milk and barley-water as a drink, as the smallest quantity of solid food, given a day before the tongue has thoroughly cleaned, is apt to induce a recrudescence of the disease. Wine and spirits are strictly forbidden, though experience has convinced me that wine and spirits prove less hurtful than the smallest quantity of solid food. If the patient is chilly, he is ordered to lie between the blankets; but, otherwise, he is allowed to lie between the sheets, and is kept tolerably cool. The heaping of extra blankets on the bed is strictly prohibited, as they tend to keep up excessive perspiration, and thus, by producing exhaustion, retard the patient's recovery.

The merits which I claim for this plan of treatment, which I have carried out both in hospital and private practice for twenty years, are: 1st. That it affords very speedy relief to the patient's sufferings—relief far exceeding that produced by any opiate. 2nd. That it checks the rheumatic action, mitigates the severity of the disease, and promotes the speedy recovery of

the patient. 3rd. That it protects the heart from mischief and thus obviates one of the most distressing maladies to which flesh is heir.

In proof of these statements, I would adduce the following facts:—1st. The patients very commonly doze, without the aid of opiates, within twenty-four hours after the first administration of the remedies and almost invariably sleep tolerably soundly for an hour at a time within forty-eight hours after the commencement of treatment, showing how great is the relief afforded. Coincidently with the repose thus obtained, the temperature of the body falls—usually to the extent of two or three degrees within forty-eight hours, and not unfrequently to its natural standard within three or four days—the frequency of the pulse decreases by ten or fifteen beats, the quantity of the urine is largely augmented, and the pain in the joint is greatly lessened.

2nd. In many instances, within a week, and almost invariably within ten days from the commencement of treatment, the patient—who on admission was in agony of pain with swollen joints, incapable of moving, and bathed in the profuse acid perspiration of rheumatic fever—becomes cool and free from pain, and anxious to leave his bed. In ninety-four consecutive cases, which were tabulated with a view to this inquiry, the average duration of the disorder after the commencement of treatment was only eleven days—in other words, the patient not only reported himself free from pain, but *was up and dressed* at the expiration of eleven days. The hospital register of my cases tells a very similar tale, though the figures are necessarily somewhat different. Taking 116 consecutive cases of rheumatic fever which were admitted under my care into St. George's Hospital, between January 1, 1860, and December 30, 1865, and excluding twenty-eight in which pericarditis existed at the time of the patient's admission, the average term during which the patients remained in hospital was only 20·1 days; and as the patients are always kept in hospital for a week or ten days after the pains have ceased in order to guard against a relapse, the average duration of the disease under treatment was only eleven or twelve days. These figures include all cases attended with endocardial murmur. Even including the twenty-eight cases of pericarditis, the average stay in hospital was only 22·2 days; a result, I believe, which has never been attained under any other plan of treatment.

3rd. I have submitted 439 cases of rheumatic fever to the alkaline treatment in hospital and private practice; the disease has not proved fatal in a single instance; in nine cases only, or in little more than 2 per cent., has any cardiac complication occurred while the patient was under my care, and in six of these the murmur was discovered within twenty-four hours after the commencement of treatment, and, therefore, before the remedies can have taken effect; nay, it may even have existed in an incipient state, though it escaped detection when the patient was first seen. Dr. Dickinson's statistics are almost more striking, because they exhibit the contrast between the effects of the alkaline treatment when properly carried out, and all other varieties of treatment, including alkalies in inadequate doses. While he was Medical Registrar at St. George's Hospital, he carefully noted all the cases of rheumatic fever admitted under the physicians, and during the space of five years there were admitted 161 patients whose hearts were sound at the date of admission. One hundred and thirteen of these cases were submitted to treatment other than alkaline, and in thirty-five of these, or in 30·8 per cent., the heart became involved; whereas the heart remained free from mischief in forty-seven out of the forty-eight cases which were submitted to the alkaline treatment—in other words, the heart was affected in little more than 2 per cent.

Thus, then, it is obvious from statistics on a large scale, carefully collected by independent observers in the wards of St. George's Hospital, that "the alkaline treatment," when properly carried out not only affords speedy relief to the patient's suffering, but almost ensures immunity from disease of the heart. It only remains for me to point out the causes which have led to the failure of this treatment in the hands of certain practitioners. In so doing, I give the result of clinical experience, both in hospital and private practice.

The first, and most common cause of failure, is the administration of insufficient doses of the alkalies in the early period of the attack—of doses which, though they would be regarded as large under ordinary circumstances, are practically useless for the arrest of rheumatic fever. An ounce and a half is the minimum dose of an alkaline carbonate, which will suffice to overcome the acid condition of the system during the first twenty-four or forty-eight hours of treatment, and in sthenic cases two ounces are often needed. Four or five drachms, which form the maximum dose, administered daily by many persons who imagine that they are using alkalies efficiently, are simply useless. They neither mitigate the pain nor shorten its duration, nor do they protect the heart from mischief.

The second cause or failure is mistaken diagnosis, and the consequent administration of alkalies in cases in which they do not exercise a curative influence. It constantly occurs to me to see persons, who have been drenched for a week or ten days with alkalies, under the impression that they were afflicted with acute rheumatism, who, on investigation, prove to be suffering from acute osteo-arthritis, or so-called rheumatic gout from gonorrhœal rheumatism, or from atonic gout—disorders which, though resembling rheumatic fever in many of their features, are yet totally distinct from it in their essential characters, and require an entirely different plan of treatment. Indeed, in most of these cases, full doses of the alkalies prove absolutely noxious; they depress the patient, and fail together to relieve his symptoms.

The third cause of failure is an improper alimentation. The diet should be restricted to broth, beef-tea, or other liquids; all solid food being strictly prohibited; but in many instances, I find that little heed is paid to this matter, and that throughout the attack the patient is permitted to take whatever nourishment his appetite will enable him to swallow. Yet there is nothing of which experience has more fully convinced me than that the strictest dietary is of the utmost importance—of infinitely greater importance than in gout—and that the taking of solid food, such as fish or meat, however small the quantity, will serve to keep up imperfect assimilation, and not only counteract the effect of remedies, but almost indefinitely protract the disease. The desire for solid food returns long before the power to digest it, and so it happens that a piece of meat taken a day before the tongue has cleaned, and the stomach is in a condition to digest it, proves not unfrequently the cause of a relapse.

[Dr. Fuller illustrates the treatment he ordinarily pursues by the following case.]

G. S., a groom, aged 22, was admitted into the Hope ward on the 18th of May. He had suffered from rheumatic fever a twelvemonth previously, and was under treatment for a period of six weeks. The present attack commenced, a week before his admission, with shivering, followed by wandering pains in the limbs, and inflammation and swelling of several of the larger joints, which at the date of his admission were red, swollen, and exquisitely painful. The heart's sounds were clear and its rhythm was normal; the skin was hot and perspiring profusely, the perspiration being intensely acid; the pulse 118, regular, and of good strength; tongue thickly furred and red at the tip and edges; bowels costive; urine scanty and turbid, with a copious deposit of lithates. He was ordered ten grains of colocynth and calomel pill immediately, and the following draught every four hours, viz. soda bicarb. 3jss., potassæ acetatis 3ss., haustûs acetatis ammoniæ ℥ij., to be taken in a state of effervescence, with half a drachm of citric acid dissolved in an ounce and a half of water. His food was restricted to beef-tea. On the following day the urine had become clear and alkaline, and the pains were somewhat easier; the draught therefore was repeated only three times in the twenty-four hours. On the 20th the urine was still alkaline, the pulse had fallen to 80, the pains had greatly subsided, and he had slept at intervals throughout the night. On the 24th very little pain remained, and as the urine was decidedly alkaline the following draught was substituted for that already given, viz., potassæ bicarbonatis 3 ss., haustus cinchonæ ℥ jss. ter die. On the 26th he was quite free from pain, and was up and about the ward; and as he com-

plained of being hungry, an egg was given in addition to the beef-tea. On the 30th he remained free from pain, and the urine was still alkaline; fifteen grains of the potash were therefore omitted, and he was allowed the "ordinary diet" of the hospital. On the 1st of June he had been a week free from pain, and he was therefore permitted to leave the hospital.

During the time I held the office of Medical Registrar, namely, from January 1st, 1845, to May 1st, 1848, 246 cases of acute rheumatism were admitted into St. George's Hospital, and they remained in the hospital on the average thirty-five days; of these 246 patients, 119, or 1 in every 2·06, had some form of recent affection of the heart; and 1 in every 6·3 had pericarditis. During the six years ending December 31st, 1850, 17 cases, or about 1 out of every 27 cases of rheumatic fever admitted into the hospital, terminated fatally.

[The results of the plan of combating the disease by full and repeated doses of alkalies present a remarkable contrast to those first referred to.]

I have submitted 417 cases of rheumatic fever to the alkaline treatment in hospital and private practice; the disease has not proved fatal in a single instance; in nine cases only, or in little more than 2 per cent., has any cardiac complication occurred while the patient was under my care, and even these, for the reason below assigned, can hardly be regarded as consequent on failure of the remedies; the disease has been arrested, and the patient has been out of bed in many instances within a week from the commencement of treatment, and in ninety-four consecutive cases which were tabulated with a view to this inquiry, the average duration of the disorder, after the commencement of treatment, was only eleven days—in other words, the patient reported himself free from pain and was up and dressed at the expiration of eleven days. The Hospital Register of my cases tells a very similar tale, though the figures are necessarily somewhat different, because, with a view to guard against relapse, the patients are kept in hospital for a week or ten days after cessation of their pains. I have gone over my case-books and the Hospital Register for five years, beginning with the 1st of January, 1860, and terminating on December 31st, 1865, during which period I find that 116 cases of rheumatic fever were admitted under my care. Excluding eighteen cases in which pericarditis existed at the time of the patient's admission, the average term during which the patients remained in hospital was only 20·1 days, which gives about 11 or 12 days as the average duration of the disease; and even including the cases of pericarditis, the average stay in hospital was only 22·2 days—a result which, I believe, has never before been attained.

In order that you may not misapprehend the nature of the alkaline treatment, I will briefly describe its object, and the means by which it can best be carried out.

The term "alkaline treatment," as I would have you understand it, implies not merely the administration of salines and small doses of alkalies, but the exhibition of alkalies or the neutral salts in full and repeated doses—in doses adequate to produce alkalinity of the urine, if possible, within twenty-four hours. Whether it be that the skin and kidneys form the channels by which the poison of rheumatism is usually eliminated, and that the condition of their secretions affords an index to the amount of the rheumatic element in the blood, most certain it is that in rheumatic fever the urine is usually intensely acid and loaded with lithates, and the perspiration profuse, sour-smelling, and acid to a degree not met with in other disorders; and that so long as this condition of the secretions continues, the temperature of the body and the pulse keep up, the pains persist, and the heart is liable to become affected. It is equally certain that as soon as this extraordinary acidity is counteracted, as shown by alkalinity of the urine and a decrease in the acidity and profuseness of the perspiration, the pulse and the temperature of the body fall, the pains diminish, and the heart may be regarded as safe from attack.

I will not stop to inquire whether there is trustworthy evidence of a distinct rheumatic element in the blood—an acid material which alkalies may neutralise and counteract—or whether the whole train of symptoms observed in rheumatic fever may not be referable to perverted nervous action and consequent

local disturbance of nutrition. The disease is certainly attributable to malassimilation, and my impression is that the nerves play a far more important part in its causation than is commonly supposed. Probably we should not be far from the truth if we were to say that rheumatic fever is due to the presence of an acid product of a peculiar form of malassimilation which frequently originates in disturbance of the nervous system. Practically, however, it matters very little what theory you adopt: the indications for treatment are clear and intelligible, and must remain unaffected by any theory. They are simply these—to restore the normal condition of the urinary and cutaneous secretions, to promote the elimination of the rheumatic element by keeping up a free action of the bowels, and meanwhile to tranquillise the patient's irritability and mitigate his sufferings.

[Opium, although the best of all sedatives, is an unsafe drug in acute rheumatism, it checks secretion and tends to perpetuate the acidity on the existence of which the disease depends. Speaking of the blister treatment of acute rheumatism as pursued by Dr. Herbert Davies, Dr. Fuller observes:]

I believe that no other method of treatment at present known has the slightest influence in shortening the duration and mitigating the danger of rheumatic fever. The blister treatment, however, deserves a passing notice. Whatever the rationale of its action, there cannot be a doubt that it fulfils in some degree the indications for treatment which I have already pointed out. It renders the urine alkaline, probably by the shock which it produces and the drain to which it gives rise; and it also seems, in some instances, to shorten the duration of the disease. But I have seen and heard enough of it to know that it cannot be trusted to for the protection of the heart, and that the indiscriminate and extensive blistering of the inflamed joints, which constitutes its very essence, is often productive of excessive pain, and may not be unattended by danger.

I will proceed to give you full directions for carrying the alkaline treatment into effect. And first as to the alkali and neutral salts which should be selected, and the dose in which they should be given. Practically it matters little whether soda or potash be given, or whether the alkali be free or combined with any of the vegetable acids; but ammonia and its salts do not fulfil the indications for treament so often referred to, and fail to exercise any influence over the course of the disease. Experimentally I have given a solution of ʒ ij. of carbonate of ammonia every three hours, rendered effervescent by the addition of ʒ ss. of citric acid; and I have continued this treatment for eight consecutive days without any apparent result beyond that of rendering the pulse rapid and weak, and ultimately causing the patient to vomit; the urine remained intensely acid, and usually loaded as at first; the perspiration quite as sour and profuse, and the rheumatic pains just as severe. But I have repeatedly tried the experiment of giving soda alone and potash alone; I have given the carbonates of each alkali alone, and the neutral salts of each alkali alone; and I have also given both the free and the neutral salts in every variety of combination. The only difference I have been able to discover between these various methods of medication is that the stomach is usually more tolerant of the remedies in their neutral form than when they are uncombined, and that to some persons potash proves less nauseous than soda; but inasmuch as when the stomach is unduly acid a free alkali will accomplish what a neutral salt will not, and inasmuch also as soda forms an important element of the blood, and may be fairly presumed to induce certain changes which would be imperfectly effected by potash alone, my usual practice is to combine the two alkalies, giving a certain proportion of both in the form of neutral salt, but adding a few grains of the carbonate of one or other of them in a free state. A favourite formula is the following, viz. ʒ ss. or ℈ ij. of the acetate of potash together with ʒ jss. of carbonate of soda dissolved in ℥iij. or ℥jv. of water, rendered effervescent by the addition of ʒ ss. or ℈ ij. of citric acid, or ℥ j. or ℥jss. of lemon-juice.* The result is the administration of acetate of potash and citrate of soda with about ʒ ss. of uncombined carbonate

* If the bowels are torpid, I vary the form of this draught by prescribing ʒ ss. or ℈ ij. of potass tartrate of soda instead of the acetate of potash, and tartaric acid instead of the citric acid

of soda. In most cases this draught is well borne by the stomach, and if repeated every four hours will render the urine alkaline within twenty-four hours; but in severe cases it may be necessary to give it every three hours, for if administered less frequently the urine will sometimes remain acid until after the lapse of thirty-six or even of forty-eight hours, and thus the heart will be exposed for so much longer to the risk of inflammation. In exceptional cases the amount of acid formed is such as to resist the effect of these doses of alkalies for three or even four days, but experience has taught me that this happens only when the liver and bowels are sluggish; therefore whenever I find the tongue furred and yellow, and the urine acid after the alkalies have been administered for forty-eight hours, it is my practice to administer three grains of calomel—guarded by opium if the bowels are loose—or in combination with colocynth if the alvine discharges are scanty and deficient; and in either case the urine commonly becomes alkaline directly a free secretion from the bowels has been set up.

As soon as the urine has been rendered alkaline, whether at the end of the first, second, or third day of treatment, the alkaline draught is repeated every six hours only; and if on the following day it still retains its alkalinity, the medicine is given twice only in the twenty-four hours. If that dose suffices to keep the water alkaline for two days more, quinine or bark is given in combination with half or less than half of the alkali contained in the former draught; and as the tongue clears and the symptoms subside the quantity of the alkali is cautiously diminished until a simple quinine draught is taken. Meanwhile, when the tongue has cleared satisfactorily, a little fish or meat is allowed in addition to the beef-tea or broth to which the diet had been hitherto restricted.

Such is the treatment I would have you pursue in rheumatic fever. Its success is sufficiently attested by its results.—*Practitioner, March* 1869, *p.* 129, *and St. George's Hospital Reports, Vol. III*, 1868, *p.* 1.

9.—ON THE USE OF ACONITE AS AN ANTIPHLOGISTIC.

By Dr. Samuel Wilks, Physician to Guy's Hospital.

[Our most potent remedies are doubtless to be found in those drugs whose direct action is on the nervous system,—such are opium and digitalis. It is probably in the direction of neuro-pathology that we may expect to make our best advances.]

Physiologists have, of late years, given more special attention to the action of the sympathetic nerve on the blood-vessels: we were formerly content to believe that their sole duty was to rule over the viscera, but experiments prove that, as vaso-motor nerves, they control the blood supply through the arteries of the body, and thus directly affect nutrition. Dilatation of the vessels, and increased temperature, or diminution of temperature, with final atrophy, are now well known to result from experiments made on these nerves. There is thus opened up a new field of inquiry, both in pathology and therapeutics, since the morbid condition of so many organs and tissues may be dependent on an increased supply of blood on the one hand or a diminished supply on the other.

For example, as in many nervous affections, an exalted or depressed function of the brain or spinal cord might be supposed to be dependent on an increased or diminished blood supply; so those agents which would act on the nerves to influence the vessels, either to contract or dilate them, would be the correct remedies: thus the reason which some practitioners give for the use of belladonna and strychnine. With the same object in view, the theory has suggested to some even a simpler method, and they have thought that, in the application of heat and cold, they could control the blood supply to the various organs, and by these simple agents be in possession of an almost universal remedy for disease. Experience is showing that these are valuable agents, even if they have not fulfilled all the objects which were

expected from their use. Hitherto the best remedies have been those which time has proved to be beneficial, and which came into use regardless of any *à priori* consideration as to their *modus operandi*. Amongst the medicines which have a marked and decided control over nervous action, the most striking are opium, quinine, aconite, digitalis, &c. All these have, under peculiar circumstances, a marked effect in controlling inflammatory processes, and the accompanying febrile action.

In a part of the body which is inflamed the blood-vessels are dilated, but whether this condition is to be regarded as the first stage, or simply as a necessary accompaniment to increased cell growth, according to Virchow, does not much concern the argument therapeutically, since, as a matter of fact, a remedy which acts on the vessels to their contraction, tends to arrest the inflammatory process. Thus the application of nitrate of silver to the eye in conjunctivitis, or to the skin in erysipelas, will contract the vessels and allay the inflammation; also the strapping of a joint or testis will effect the same in a mechanical manner. I suppose it must be admitted that, if an internal remedy could act on the vessels of the conjunctiva in the same way as a local one, to arrest the inflammation, it would be deserving of the name antiphlogistic; and if so, the administration of iron, now a very favourite remedy for erysipelas, if it act by constringing the vessels must be entitled to the same name. At present, I believe, the usual explanation of its beneficial action is, that it improves the condition of the morbid blood.

There would then appear nothing remarkable in the idea of an antiphlogistic remedy, or one that should so act on the nerves, and through them on the blood-vessels, as to actually arrest an inflammatory process. If we remember the remarkable effects which result from the administration of quinine in some febrile disorders, we are led to the conviction that its mode of action must have been in the manner indicated; thus I have as much reason to believe that I have cut short a case of acute rheumatism by this drug, as I have by the use of any of the ordinary remedies. In the same sense, I should say that opium is the most important anti-inflammatory remedy at present known. It never could have maintained its position as a medicine in all forms of inflammation unless this had been its true nature. In various forms of inflammation of the abdomen and chest, it is a remedy almost universally given; and if administered less in affections of the pulmonary mucous membrane, it is only because there is a fear that by lowering the respiratory process it may tend to prevent expectoration; but it is in these very maladies that its effects are most striking. I have seen the case of a child suffering from bronchitis, and supposed to be dying from an over-dose of laudanum, who, from time to time, fetched what appeared to be its last breath, during a most anxious period of two or three hours, and then recovered from the effects of the medicine, and, what was most extraordinary, from the disease at the same time. I have seen a somewhat similar case of croup, where there was a narrow escape of poisoning by opium, and a sudden arrest of the symptoms. How a sore throat or bad cold can be at once checked by a Dover's powder, or dose of laudanum, is in every one's experience; as also, how an ulcer on the surface of the body will sometimes rapidly heal under the influence of opium. This well-known fact would, it might be thought, have given us a hint as to the controlling power of the drug in nutritive processes. I cannot refrain from mentioning a case which came under my own notice, where the remedy saved the patient's life almost as directly as if he had been snatched out of the river when on the verge of drowning. A friend, seventy-five years of age, was knocked down in the street and struck upon the leg; the skin gave way, ulceration ensued, and in a few days nearly the whole of the limb, from the knee to the ankle, was denuded. He took to his bed, and I visited him to take a final farewell. I found the ulcer still rapidly spreading in all directions, and I was asked to prescribe. I therefore wrote to his medical attendant, stating that, following the footsteps of my old master Mr. Aston Key, I should have ordered in such a case a grain of opium every four hours. This was done, and I heard in a day or two that the old gentleman was better, and when I visited him at the end of another week, I found a most re-

markable change had taken place; not only had the ulcerative process stopped, but healing had already commenced. After this, repair went on rapidly, and he was soon able to leave his bed, and continue his out-of-door exercise.

Since, therefore, we see this very evident action of opium on nutritive processes, and as we already know that this drug is of service in various inflammatory processes, we might advance a step further, and infer the possibility of opium being able, in a very large dose, to arrest such a disease as pneumonia at its onset. In speaking of this disease, and some of the usual remedies for it, I am reminded of antimony, which has long had the reputation of being an antiphlogistic. It is one which I still prescribe, and believe that its action is beneficial. It may be supposed, like many other of the metals, to exert a contractile influence over the small arteries, and thus, in the same way as lead or iron, tend to arrest hemorrhage.

Amongst other remedies which have had a long-timed reputation, as capable of depressing the heart's action and lowering the circulation, is aconite, but one which has never come into general use on account of its highly poisonous nature, and from want of precise rules as to the class of cases demanding its administration. There have, however, always been some in the profession who have attributed the very highest value to its use; there is nothing remarkable in this, when I know, with such a time-honoured remedy as digitalis, there are many medical men to be found who are ignorant of the indications for its employment; and yet it is a drug which may be put before any others in the Pharmacopœia, as showing the most striking effects from its administration. As regards aconite, I am acquainted with two medical men who in the course of a long practice have been in the habit of daily using it, but have not cared to speak of it too openly for fear of having their names associated with members of an eminently quack system; and it may be remembered that the late Mr. Liston brought no little odium upon himself on account of his advocacy of the use of this drug in erysipelas.

I myself have been in the habit for some years past of occasionally ordering this remedy, when favourable cases occurred, but unfortunately have preserved no notes of them. As a rule, hospital practice does not afford a good opportunity for the trial of t e drug, as it is only at the onset of an inflammatory process that it is lik ly to be beneficial; it must, therefore, be left to gentlemen in general practice to efficiently put its properties to the test. I will give a few cases where I have a firm conviction that the medicine acted beneficially, and I may add I am still engaged in the trial. Aconite, it may be remembered, has a most powerful depressant influence on the system; in those persons who have accidentally taken a poisonous dose, the heart action has become enfeebled and the pulse very slow; it is supposed, therefore, to have a very direct effect on the circulating system, through nervous agency: but whether the febrile condition, which is diminished under its use be due to the simple lowering of the heart's action, or to a more immediate contraction of the blood-vessels, may be a question, but I believe that the latter opinion is the one most usually held.

Pneumonia.—John D., aged 17, admitted into the hospital Dec. 31, 1867. He was a healthy lad, and by employment a groom. Three days before admission he was exposed to wet and cold, when he was seized with a shivering fit and catching pain in the side, followed by great headache and loss of appetite. On admission his appearance at once denoted the malady from which he was suffering; his face was flushed, his breath quick and catching; and in a high state of fever; pulse 88. At the lower part of the left side the chest was dull on percussion, and there was ægophonic bronchophony. He was ordered to take three drops of tr. aconite every four hours, and to be put on low diet. On the following day, Jan. 1, he was not seen, but on Jan. 2 the change in his appearance was most marked, and it was at once evident that the inflammatory process had ceased; he had regained his natural look; the skin was cool, tongue cleaning, and the pulse at 60. An examination of the chest showed that there had been no advance of the pneumonia, but that

the affected part was recovering itself. The medicine was omitted; he made a rapid convalescence, and left the hospital well on Jan. 13.

Acute Rheumatism.—Frances C., aged 15, admitted to the hospital July 17. All the joints swollen, red, and so acutely painful that an accidental jarring of the bed forced her to cry out; and with this all the other usual symptoms of rheumatic fever; pulse 104. She was ordered two drops of the pharmacopœial tincture, every three hours, and to be continued regularly through day and night. This was done and administered without intermission during the day and night of the 18th, and during the day of the 19th. In the evening she became delirious and so strange in her manner that the house surgeon was sent for, and ordered a placebo. He informed me on the following morning that he believed she was hysterical, and was quite unaware that she was the subject of acute rheumatism, as he found her lying on her side with her arms over her head, screaming out and moving about in a manner which is seldom seen when the joints are inflamed or painful. When I saw her on the following day, I observed a strangeness and restlessness in her manner, and she complained of a burning in her throat and pain in her back, but all trace of the rheumatism was gone. I had no hesitation in attributing the new symptoms to the effects of the remedy. She subsequently had a slight pain in the ankle and wrist, and then rapidly convalesced. She was walking about the ward on August 1.

Acute Rheumatism.—John M., aged 16, admitted Sept. 23. He had been ill three days with febrile disturbance and pains in the limb. I was unable to say whether it was the onset of rheumatism, or merely a "bad cold," which is technically called "febris catarrhalis rheumatica." He had had rheumatism before, and there was present a slight systolic murmur; saline only was ordered. On the 24th he was much worse; he had a sweating skin, with the characteristic rheumatic odour, with pains in all his joints, and pulse 104, temperature 102°, and the case was now clear. He was ordered five drops of tr. aconite every four hours, night and day. I did not see him on the 25th, but on the 26th I was much struck with his altered condition: instead of finding the disease more developed, the pains in the limbs had diminished, and the fever was disappearing; the most striking fact being that the pulse was 64, having been reduced by 40 beats, the temperature 99°. He had taken ten doses of the medicine. I now ordered it to be taken only three times daily. He continued to improve, and on the 28th appeared tolerably well; pulse 60. He then omitted the aconite and continued to convalesce; when, on Oct. 8th, being dissatisfied at taking no medicine, I ordered him some quinine. On Oct. 12th he said he was very unwell, and I then ordered him an aperient. On Oct. 15th I found him in bed with a relapse of the rheumatism, complaining of all the symptoms as on admission; pains in the joints, hot and sweaty skin; pulse 124. I again ordered the tr. aconite to be taken every four hours. I did not see him on the 16th, but on the 17th all the febrile symptoms were subsiding, and the pulse was down to 80. On the 18th it was 72, when I omitted the medicine. After this he convalesced and left his bed, though he still complained of occasional pain in the knee or wrist. His pulse was now always between 80 and 90.

Whooping Cough (?) and Bronchitis.—Caroline C., aged 20, admitted May 31; had been ailing with a severe cough for two months, and what her medical attendant believed to be pertussis. She had got very thin; had considerable dyspnœa, face dusky, and eyes swollen; had severe paroxysms of coughing, which lasted some minutes, in which she whooped, and followed by the expectoration of a large quantity of purulent phlegm. She occasionally vomited and spat up some blood. I ordered her tr. belladonnæ ♏x every four hours. She gradually became worse, and on June 4 I found her sitting up in bed with much dyspnœa, cheeks and lips livid, mucous râles throughout the chest, tongue furred, pulse 144. I now ordered her tr. aconite ♏iv every four hours. June 5, seemed little better; pulse 140, respiration 37. June. 6, decidedly better; pulse 100. On June 8, still improving, although expectorating very much. In a few days the cough less, the patient altogether bet-

ter: some cascarilla mixture was ordered, and she gradually gained strength and flesh, and left tolerably well at the end of the month.

Chronic Catarrh.—A gentleman came to my house complaining of a bad cold which he had had for two or three weeks, and could not get rid of; he had running from the nose and eyes, with pain over the forehead, as is seen from the effects of the iodide of potassium. He had taken all the ordinary medicines without effect, and therefore I thought it a good case to make trial of the aconite, which I ordered him in ♏5 doses every four hours. He called on me three days afterwards, when all the symptoms were subsiding. It is probable that opium might have had the same result.

In giving the above cases I should mention that I have given aconite to other cases without success, but they were scarcely comparable with the foregoing. Those of late were the cases of two women of middle age with subacute rheumatic gout of three weeks' duration, and in which, there being no marked effect, in a few days I omitted it. In a case of pneumonia of one lung the stages were passed through in the usual manner whilst the remedy was being taken, no obvious effect being produced. Also, in a girl who came in desperately ill with acute rheumatism and pericarditis, I gave a few doses, and then thought it right to omit it for more approved remedies. I now regret this, as the case would have afforded a good example for the trial of the remedy.

In the successful cases I have given above, I should direct attention more especially to the first three, where I cannot but doubt of the efficacy of the remedy, seeing that, besides the subsidence of the disease which was being treated, there was such a marked influence on the pulse. This cannot be accounted for except by the action of the remedy. Their publication cannot at present prove much, but they tend to corroborate the opinion of those who have used aconite beneficially, and may tend to further its employment in the hands of others.—*Practitioner*, *Dec.* 1868, *p.* 330.

10.—ON THE EFFECTS OF REMEDIES UPON UNCOMPLICATED ACUTE RHEUMATISM.

By Dr. W. H. Dickinson, Senior Assistant Physician to St. George's Hospital.

[The following paper is the sequel to some tables which very fully record the result of treatment upon a considerable number of cases of acute rheumatism.]

The tables supply the following facts:—161 cases of acute rheumatism, as yet without evidence of cardiac affection, were admitted. In 36 of these, heart complications arose while the patients were under treatment. These complications, though more frequent early than late in the disease, were found to have come on at all times during the first four weeks of the rheumatism. The cardiac disturbance was found in the first week of the disease in 12 cases; in the second in 9; in the third in 5; in the fourth in 3. In 7 cases the date of the murmur was uncertain.

These statements cannot in strictness be looked upon as contributing to the "natural history" of rheumatism, for all the patients were subjected to therapeutical measures, and some to measures which, there is reason to believe, conferred such protection upon the heart as to reduce the proportion of cardiac affection.

A nearer approach to the natural proportion of cardiac disturbance would probably be obtained by excluding all the cases subjected to alkaline treatment. This would give 35 cases of heart affection coming on in hospital among 110 of rheumatism.

The chief object, however, of this communication is to examine into the frequency of cardiac mischief in relation to different methods of treatment.

Of the 161 cases of rheumatism, 48 were subjected to the alkaline treatment—that is, to the daily administration of between half an ounce and an

ounce and a half of the carbonates and vegetable salt of potash and soda. Three cases were treated with salt of ammonia. 110 cases were treated by various means, other than the full alkaline system, including blood-letting, mercury, nitre, guaiacum, opium, iodide of potassium, quinine, and such small doses of the alkaline salts as are described as "partial" or come under the designation of salines.

Among the 48 patients under alkalies one case of heart affection was recorded; among the 3 under ammonia, none; among the 110 under treatment other than alkaline were recorded 35.

Thus the alkaline treatment gave a proportion of heart disease of 1 in 48; non-alkaline treatment a proportion of heart disease of more than 1 in 4. The number of cases is large enough to afford a weighty deduction.

It is, of course, not unlikely, as the notes which the tables represent were taken for the most part in the ordinary course of hospital work, that a slight or transient murmur may now and then have been overlooked; but this source of error must have affected alike all modes of treatment. With the evidence before us it is not possible to question that, as compared with the other methods in use at the same time, the alkaline system gave a much smaller proportion of cardiac disease.

It will be observed that under alkalies the duration of the disease was shorter than under most other plans, a point, however, of little importance as compared with the safety of the heart.

It is not necessary to consider other remedies; venesection and mercury are practically abandoned in acute rheumatism. Next to the alkalies, nitre appears to give the best results. With regard to the other drugs which are represented in the table, we can trace no advantage from their administration, and need not too precisely inquire whether they are mischievous or merely useless.

With regard to Dr. Davies's blistering system—a method of treatment of which the tables give no example,—from clinical evidence as well as the theoretical probability of the withdrawal, by this means, of a rheumatic poison, we may believe it to be attended with advantage. On the other hand it is inconvenient to the patient, and probably does not protect the heart to the same extent as can be claimed for alkaline medicines.

It does not seem that any method of treatment which has yet been invented is able entirely to do away with the tendency which acute rheumatism has to affect the lining and covering membranes of the heart. Of late years, alkalies in some form have been almost invariably used at St. George's in cases of this disease; thus a much larger number of cases have every year been subjected to this treatment than was formerly the case. Dr. Reginald Thompson, the present medical registrar, has collected a considerable number of cases both of endocarditis and pericarditis, under alkalies; but it is not necessary to dwell upon this fact, since, as no other method of treatment has been employed to any extent during the same period, we have no means of comparing these cases with others under different circumstances. Though it must be allowed that heart complications occur occasionally under alkalies, the conclusion may fairly be drawn that, as compared with other modes of treatment, alkalies give the best results.

It may not be out of place to refer to the experience of Dr. Fuller, who was the early, and has been the persistent, advocate of the alkaline treatment. He states that among 168 cases of acute rheumatism, the heart became involved, subsequent to the commencement of the treatment, in only five.

Whether alkalies give better results than mint water, or what is called expectancy, is a question to which the details I have given supply no answer. If the proportion of cardiac disturbance which occurred (as shown in the tables) under treatment other than alkaline be allowed to approximate to that which would have taken place had nothing been done, we may see something of the results of expectancy in the non-alkaline cases. Some of the methods of treatment were apparently harmless; we may perhaps believe that under their influence the disease was not materially aggravated, and did

not produce more than its natural proportion of cardiac disease. And if the proportion of cardiac disease natural to acute rheumatism is at all like what occurred in the non-alkaline cases, we must believe that alkalies reduce the proportion of cardiac disease which belongs to unmedicated acute rheumatism. With this conclusion I should myself be most unwilling to withhold the use of alkalies in any suitable case. Those cases may be regarded as suitable where there is free generation of acid.

A few words of practical suggestion may form a not unwelcome conclusion.

In order to obtain the best results from the alkaline treatment of rheumatism, it is necessary that it should be regulated with a watchful care. In the beginning of the disease, when there is rapid production of acid, the alkalies should be given freely, and, above all, frequently. Taking the urine as a guide, it should be made alkaline as soon as possible, and kept so with no intervals of acidity. To do this, the salts must be given at first in considerable doses, and at short intervals; three or four scruples every two or three hours, as ordinary treatment for an adult. As the disease progresses, and the acid tendencies of the patient diminish, it is necessary to lessen the strength and the frequency of the medicine in a gradual manner, with continual reference to the urine, guarding against excess of alkali towards the end of the disease as carefully as against deficiency at the beginning.

It appears to matter little whether potass or soda, vegetable salts or carbonates, are used. Citrate of potass may be given alone, or with acetate or bicarbonate. Nitre and acetate of ammonia are, at St. George's, not unfrequently used as adjuncts. The form of prescription may be safely varied according to the circumstances of each case and the fancy of the practitioner. Perhaps a simple solution of citrate of potass in water is as effective and as little objectionable as anything. This salt, or its equivalent, may be given in the general quantity of about an ounce in the twenty-four hours; rather more at the beginning of the disease, less towards the close. In most cases quinine or bark may with advantage be added as the active symptoms wane.—*Lancet, Feb.* 20, 1869, *p.* 254,

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11.—ON THE CAUSE OF SCURVY, AND THE ACTION OF THE DIFFERENT SO-CALLED ANTISCORBUTICS.

By Dr. Archer Farr.

There have been many speculations with regard to the cause of scurvy; one authority affirming that it is owing to the absence of vegetables in the food taken; another maintaining that a deficiency of the salts of potash is the cause; while a third gives it as his opinion that it results from bad ventilation, deficient water-supply, wet seats, &c.,—all of which fail to explain the real cause of the disease. That scurvy is not owing to a deficiency of the salts of potash in the food of the sailor, and that salt meat contains all the elements necessary for nutrition, have been proved beyond doubt; while that the belief that fresh succulent vegetables or lime-juice are indispensably necessary to the cure of the disorder is an error, is proved by the fact that beef-tea and milk will effect a cure in the absence of both. If salt meat contains all the elements required for nutrition, how does it produce scurvy? Purely by its hard and indigestible nature as food, and its inability, from its resistance to peptic change, to supply for any length of time all the conditions necessary for proper digestion. Added to this is man's natural aversion to the continued use of one, and only one kind of food for any length of time.

Physiology teaches us that the gastric fluid is secreted only in the presence of food; but that it ceases to be secreted, although food be present in the stomach, as soon as the wants of the system are satisfied. Now, what takes place during digestion where the only food employed consists of salt meat—sometimes of the consistence of buckhorn—and dry biscuit? The food remains in the stomach probably five or six hours, while the wants of

the system continue unsatisfied. All this time the stomach is being excited to secretion, while the gastric juice, from this exhausting secretory action, becomes deteriorated in quality, or in the end, perhaps deficient in quantity; and the result is that the whole digestive process is brought to a standstill. Scurvy, therefore, is the result of mal-nutrition. But we know that if lime-juice or vegetables be added to the staple fare of salt meat and biscuit, scurvy may be prevented. And the prophylactic power of the lime-juice does not, as is generally supposed, depend upon its having any direct action upon the blood, but upon its immediate action on the contents of the stomach, by serving as the agent by which these hard ingesta become reduced and rendered fit for absorption—in fact, by taking the place of the gastric fluid. Now, what facts have we to strengthen this hypothesis? In the first place, that the solvent powers of the gastric fluid depends, for the most part, upon the acid it contains, it having been found to yield, on analysis, hydrochloric, acetic, lactic, malic, and phosphoric acids; one being capable of taking the place of the other. Hence it is that the acid wines and vinegar become antiscorbutics. Secondly, that the solvent effects of the different acids upon the fibrin of meat is well known, and is taken advantage of in making analysis of the contents of the different viscera in medico-legal investigations. We learn by experience that saur-kraut, spruce-beer, oranges, lemons, and their juices, and all kinds of esculent fruits and vegetables, possess more or less so-called antiscorbutic properties; also, that the acid wines, vinegar, brandy, molasses, pickles, and sauces tend greatly to prevent the occurrence of scurvy—indeed, it would be difficult to name anything contained in the category of eatables and drinkables which does not possess, to a greater or less degree, some antiscorbutic value. Now, it must be patent to all who possess the smallest knowledge of chemistry, that if vinegar and brandy serve at all to prevent the disease, it cannot be owing to the salts of potash they contain; while it is equally certain that they must operate in a manner quite different from that in which potatoes and green vegetables effect a cure. The juice of the lime and lemon, acid wines, beer and vinegar, act by virtue of their solvent effect upon the food contained in the stomach; whereas alcohol can only act through the medium of the circulatory system. The secret of vegetables and fruits being so potent as antiscorbutics is this:—The alimentary canal may be very appropriately termed a double organ, inasmuch as the animal food is digested by the stomach, and the vegetables by the intestines. Hence man has two distinct appetites, one for each kind of food—the animal and vegetable. He may eat to repletion of the one kind, and then partake heartily of the other. Is it not fair to assume, then, that, in the case of the scorbutic patient whose stomach digestion has been most imperfect, the intestines, which for weeks have been almost wholly unemployed, should, upon the accession of vegetable food, play an active part in supplying the necessary nutritive material to the system? Scurvy is to be prevented, then, in two ways: either by employing the stomach better, or by giving the intestines more to do.

Food should be so constituted as to contain within it the materials from which may be drawn all the primary elements of the blood; and no one kind of food is so rich in these as flesh, the fibrinous portions being the most essential. It is true that wherever scurvy has happened, whether on land or sea, it has always been in the absence of vegetable food; but what other condition is there that strikes one? That the fibrinous and albuminous portions have *always* been deficient in the *materia alimentaria* supplied, or they have been presented in such a form as not to admit of their being, for any length of time, properly and effectually reduced; the latter being the case where salt meat has been the cause, and the former where bread, tea, coffee, bacon, cheese, &c., have formed the diet under which an outbreak of scurvy has taken place. We have sufficient proof that the fibrinous and albuminous principles play a most important part in eradicating scurvy in the fact that vegetables will sooner effect a cure when combined with salt meat than when administered alone, and still quicker conduce to such result when taken in conjunction with fresh meat. And again, a healthy, growing youth with

craving appetite, whose stomach is equal to any emergency in the way of food, will outlive a much longer voyage on salt meat and biscuit than the man in middle life with fastidious stomach; although in the case of the youth the demands of the system for food are greater, in order to supply the wants of a growing frame. What stronger arguments can be adduced in favour of my theory? What greater proof can we have, in opposition to the prevailing opinion, that vegetables are chemically antiscorbutic—that they supply a something which meat does not possess, and which the body requires? The four varieties of food necessary for the maintenance of nutrition are represented in bread and butter, and how commonly do we see well-nourished, blooming children living almost exclusively upon it. But the fibrinous and albuminous principles contained therein being proportionately very small, it would fail to supply the necessary muscle-making material were it not for the child's astonishing capacity for consuming its own weight of such food in a comparatively short time. The adult in attempting to live exclusively upon bread and butter would find that he could not eat sufficient to sustain him. And hence it is that children will thrive under the same conditions that infallibly conduce to scurvy in the adult. It is remarkable that the many different authors writing upon this subject should not have observed this.

The great desideratum, then, in catering for the mercantile marine, with a view to prevent the occurrence of scurvy, should be that the sailor be provided with good flesh-food; and since salt meat must of necessity always form the basis of his dietary, every care should be taken that it be of recent pickle, bad salt meat being too commonly the cause of the disorder. Nothing would tend more to stamp out scurvy from our seas than Government making it compulsory on ship-owners not to ship their meat-supply as salt meat, but compel them to take it in as fresh meat, and thus ensure its being laid down in the brine within a week of the vessel's sailing. This plan could not fail to secure to the sailor a supply of wholesome meat, whereas as the law stands, he may have palmed upon him the vilest trash, the pickle-tub being made the receptacle of all that is loathsome. The carcase once in the brine, there is an end to all history as to its mode of death; neither do we know how long it may have been "sepulchred below;" and consequently many a ship is sent to sea with scurvy in the tub.—*Lancet, March* 27, 1869, *p.* 424.

12.—ON THE TREATMENT OF CANCER BY ARSENICAL MUCILAGE.

By Dr. Alexander Marsden, Surgeon to the Cancer Hospital, London and Brompton, and to the Royal Free Hospital.

The arsenical mucilage mode of treatment is applicable to all forms of cancer, except the cystic or colloid, provided they have not exceeded certain limits, viz., four square inches, and then not more than a fourth must be attacked at once. When a cancer has exceeded this limit, I know of no means that ought to be used to extirpate it but the knife; and it must not be supposed because I so strongly recommend the arsenical mucilage, that I would discard the use of this instrument altogether; for in some cases it is our only hope.

The paste may be applied to cancers situated on any part of the body except inside the mouth or nose, parts, in fact, where the use of the curative agent would be dangerous. I do not recommend its use when the disease is deeply seated, but for many cancers on or near the surface, this mucilage is the least painful and the most certain remedy I know. During the last seventeen years I have fully tried every known caustic, and now firmly believe that this is the best.

The application of arsenious acid is not new; it has been used in various ways and compounds, but hitherto such success has not attended its use, as

to make it appreciated as it ought to be. The mode I adopt is as follows. A thick paste of arsenic is made according to the following formula—

Arsenious acid, 3 ij.
Mucilage of gum acacia, 3 j.
To be well mixed together, and made into a thick paste.

The patient's health having been attended to, the whole of the cancerous surface is to be spread over with this paste, provided it is not more than a square inch, and it must be sufficiently thick not to run; a piece of dry lint is then pressed on to it, overlapping the paste half an inch all round; this must be left for a short period, say ten minutes, by which time any superabundant paste will have been taken up by the extra lint, which is then to be carefully cut away with a sharp pair of scissors; in an hour, or at most two, the lint covering the paste will have become dry and hard, and it will adhere closely and firmly to the cancer. In the course of twenty-four hours the surrounding parts will commence to swell, become red, and to a certain extent inflamed, and the patient will experience a drawing pain. In general this is by no means severe, and does not last more than one or two days. At the expiration of from forty-eight hours to three days, according to circumstances, bread-and-water poultices are to be constantly applied and changed every two or three hours; the pain, redness, and swelling, will by this time have subsided, and a distinct line of demarcation be seen extending entirely around the cancerous mass; the skin ulcerates, and a fissure is formed, separating the slough from the healthy tissues; the fissure continues to deepen, until the entire cancer comes away, leaving a healthy cup-like depression, varying in size and depth according to the mass removed. Healthy granulation will now commence and it will be well to continue the poultices for some time; indeed it often happens that no other application need be used. Of course we must be guided by circumstances, for granulation proceeding too rapidly, too slowly, or in any abnormal manner, must be treated according to the known rules of surgery. Great diversity will be found as to the time of the slough coming away, in cases of small extent and not extending deeply into the tissues, the periods will vary from six to fifteen days, but in those of greater size, from twelve to thirty. In some instances only one application of the paste will be necessary, but it will in general be found advisable to apply it every second or third morning, till the desired effect is produced; no rules can be laid down as to how often this must be done; the experience of the surgeon and the progress made must decide. When it is intended to re-apply the paste, the former piece of lint must be carefully soaked for some time with warm (not hot) water, and after it has come away, the mucilage be used as before, recollecting that until the last application that is intended has been made, poultices as a *rule* are not to be used, unless under special circumstances; and that after a decided line of demarcation has been formed, no more paste is to be applied. In general it will be found that after the slough has come away, the whole of the disease has been removed; but sometimes this will not be the case, and then the mucilage must again be had recourse to; in others it will be found desirable to remove a portion of the dead cancer before another application of the paste. This, however, is only necessary when the cancer becomes hard and callous, and will not allow it to penetrate. I have also used this remedy in some cases after operation by other means. For example, not very long ago, a gentleman applied to me; he was suffering from a pedunculated epithelial cancer, situated below and a little behind the right ear, quite of a mushroom shape. The broad flat part was four inches and a half in circumference, half an inch thick, and grew on a stem less than three-quarters of an inch in diameter. It was removed in a moment with a noose of silver wire, but the root still remained; one application of the paste brought this perfectly away in eight days, and a fortnight after the patient was well. Neither knife or ecraseur could, I think, have accomplished this, and no other caustic would have performed the task so cleanly and satisfactorily. One of the most pleasing and wonderful phenomenon connected with the mucilage is the extraordinary

power of election it appears to possess; for if put on only with ordinary care, the cancer alone is attacked, the healthy structures remaining untouched, and the disease ultimately rolling out of a perfectly healthy wound.

This treatment I have used with equal success in cancer on the lip, face, head, arm, hand, abdomen, breast, penis, testicle, labium, scrotum, and foot. I have never seen any bad results from its use, except in one case, and in this the evil was temporary only, and occurred in one of our earlier cases, some years since. At the same time I must caution those who are inexperienced in its use, that it is a dangerous remedy in unskilful hands, and requires constant watching; neither can it be used, as I before stated, to cancerous surfaces of greater extent than four square inches, and then only a small portion must be attacked.

Many cases of scirrhus and medullary cancer are amenable to this treatment, particularly at an early stage, but to the epithelial it is peculiarly adapted. It is true that this form of cancer is frequently found to attack the tongue; and that except in the earlier stages of the disease, carcinoma of this organ presents to the surgeon a truly difficult task; but on other parts of the body we have this variety under very great control. I may say that a patient suffering from epithelial cancer, coming under treatment at anything like a reasonable time from the first attack, may, in nine cases out of ten, feel sure of a perfect restoration to health; such was not the case ten years ago. This reassuring fact becomes more valuable when we consider that of all forms of cancer, about one in four is epithelial.—*Marsden on Cancer, p.* 60.

13.—ON THE PATHOLOGY OF FATTY DEGENERATION.

By Dr. Edward Latham Ormerod.

The pathology of fatty degeneration may be summed up in a few lines. And, as a preliminary, I must confess that a very attentive study of fatty degeneration continued through many years has much diminished, in my eyes, the importance of the specific character from which the process takes its name. Grave as are the diseases with which it is connected and on which it ensues, the fatty change itself is comparatively of little moment, and quite secondary to the degeneration, in date as well as in importance.

It is an infiltration of fatty matter which is derived immediately from the passing blood, or is made on the spot under its influence. And, as far as concerns the human subject, it is not the physiological form of fat, margarine, which is thus infiltrated, but oleine.

The structures which are infiltrated in this manner must be previously disorganised, the infiltration being a consequence, not a cause, of the disorganisation. Structures in healthy vital activity either do not admit of such infiltration; or, where their physiological constitution allows of this, they have the power of clearing themselves of the oil. They must be disorganised, but they must not be dead, as far as death implies liability to chemical decomposition or disconnection with the current of the circulation. For, experiments show that, under such circumstances, fatty degeneration, as expressed by the formal replacement of healthy structure by fatty matter, never ensues. —*St. Bartholomew's Hospital Reports, Vol. IV.*, 1868, *p.* 67.

DISEASES OF THE NERVOUS SYSTEM.

15.—ON HYSTERIA.

By Dr. Samuel Wilks, Physician to, and Lecturer on the Practice of Medicine at, Guy's Hospital.

As in hysteria the nervous system is deranged, so every part of the body may suffer—the function of every organ may be disturbed, as well as the

nerves themselves disordered in all possible manners. Let us look to some of these irregularities. First, the nervous system proper may suffer.

The motor system may be depressed or excited; thus paralysis is a very common hysterical symptom, affecting more especially the lower limbs. A leg cannot be moved, or both legs are the subject of paraplegia. As, in such cases, the cause is want of nervous energy, so you will perceive the peculiarity of these cases—that rousing of the will is often sufficient to put fresh vigour into the system and cure the complaint. A sudden alarm has often cured the patient who has been considered as hopelessly paralysed, and this gives us an insight into the correct treatment. I need not dwell further on this subject, as I have already on more than one occasion shown you the importance of the moral treatment of hysteria. A young lady has a complaint of an imaginary kind, and you visit her daily, and treat it as if it were a reality; the consequence is that it is perpetuated, and you have assisted in making it a perpetuity. You understand the real seat of the complaint—you attack that, and cure your patient. When I have had under my care here cases of paraplegia of years' duration, most assiduously treated by medicine, and at length cured by moral means, I cannot speak too highly of the method. These cases are not often difficult to diagnose, since in a real paraplegia the patient grows thin, bedsores appear, paralysis of the bladder and rectum may be present, and the patient feels ill, whilst in the case of hysterical paraplegia the patient remains plump; there is no trouble with the bladder, or if any, it is retention of urine; the abdomen is tympanitic, bowels confined. The physiognomy of the patient and her surroundings sufficiently indicate the nature of the case. She has taken to her bed as if for the remainder of her days, and all is arranged accordingly—the stitching, the embroidery, the religious books where they can be comfortably reached, and she generally receives more sympathy from the clergymen and the lady visitors than do cases of real illness. The fact is that there are no painful and loathsome circumstances attending her case, and, from her conversation and industry with her hands, it is regarded as an "interesting" one.

Then, besides loss of motion, there is perversion of motion, and we witness sometimes, as a result of hysteria, some of the strangest movements which you can conceive. These are not of that irregular kind which we witness in chorea, but are usually of a rhythmical character; thus, instead of the body or arms being constantly writhed about in various directions they are more slowly or regularly bent in a given manner. Thus a girl was in the clinical ward two years ago who sat in a chair, and was constantly bending or bowing forward, as if saluting all those present. This continued for several months before she got better. In this case, as in all others, the greatest discomfort was produced by the use of any forcible means to restrain the movements; the cause lies in the centres within, and no approach to a cure is produced by attacking the effect. In several other cases the arm is in constant and regular motion, as if acted on by clockwork. This form has received the name of malleation. I remember a case of Dr. Barlow's where the woman had constant quick breathing, and, what is remarkable, every inspiration occurred with a beat of the heart. This continued for weeks. I have quite lately been visiting a child who has died with this form of hysteria. After having various strange symptoms for some months, she took to sitting at the side of the bed, and having some person or object before her which she could continually keep thumping with her fists or head all day long. Any restraint only added to the irritation. Chloroform, opium, conium, and other remedies, in large doses, produced only a temporary effect, and she at last died utterly exhausted, and wasted almost to a skeleton. There was no disease found in the brain.

Then, again, we meet with permanent spasm as an hysteric symptom, seen more especially in the hand, which is firmly clenched, the tendons becoming rigid and the muscles contracted when the hand is forcibly opened. Then, again, the whole body may be affected after the manner of tetanus. This is more often seen in an acute attack of hysteria, but the lockjaw may remain as a very troublesome and constant symptom. I draw your attention to the

fact, for it requires often all our acumen in order to distinguish a real disease from an hysteric one. Then also you may have that remarkable condition known as catalepsy. This in its purity is not very common, although I have seen two cases of it in the Hospital. One of my patients would sink into a kind of swoon or deep sleep, during which condition she would stand perfectly still in the middle of the ward, or, if in bed, would remain in any position in which you chose to place the body. Minor degrees of the cataleptic state are frequently met with, and not uncommonly in the epileptic of both sexes, especially after the occurrence of a fit. During the drowsy stage which follows you will frequently find that the patient's limbs will remain in any posture in which you place them. You will observe, in fact, that the whole nervous system is deranged in hysteria. You will have evidence of irritation of the cerebro-spinal system in the movements I have mentioned, and in the strange mental vagaries; then also of the deadening of the centres, as seen in the paraplegia and in this disposition to lethargy. We are sometimes called in to a person lying perfectly insensible, and apparently as if near her end, but it is a mere phase of hysteria. An extreme form of this condition, when continued, is usually styled trance. The whole nervous system may be so lowered in tone that the person lies helpless and insensible, but the functions of life slowly go on. This state may last for a great length of time.

Then as regards the nerves of sensation, it may be said that invariably these are in some way altered in hysteria. More commonly there is hyperæsthesia of some of the senses. The patient cannot bear the light, or the least sound troubles her, but more usually it is the common sensation which is affected. Thus, sometimes no part of the body can be touched without the patient shrinking—I mean the body proper, as the chest and abdomen. Often it is some particular part, the more usual spots being those which are tender in many persons when their "nerves are low," as the middle dorsal vertebræ, the vertex, and the left side. You will find many nervous persons flinch when you touch them in these places. Then there may be some particular spot to which the whole attention of the patient is directed until that place is believed by her to be the seat of actual disease; I allude to the hysterical breast of Astley Cooper and the hysterical joint of Brodie. It is not always that the patient complains of pain, but an exquisite tenderness when the part is touched.

Then, again, there is the opposite condition of anæsthesia, where, owing generally to some violent commotion of the nervous system, the sensorium is thrown into a lethargic state, and the senses are sealed. A girl to whom I was once called received a great fright, had an hysteric attack, and fell into a state of lethargy; during this time she appeared to have lost altogether the sense of touch. The absence of sense of pain whilst that of touch remains I have already referred to, and is very commonly met with in hysteric women.

Now, besides this hyperæsthesia or oversensitiveness, our hysteric patients complain of and suffer pain. You must not think, because your patient is hysterical that she does not feel pain, for assuredly the suffering of many hysteric women is real. There has been, and still is, much controversy as to the seat and cause of these pains. Are they merely subjective, and due, as is the hyperæsthesia, to a morbid sensibility of the sensorium, or have they a local seat? and, if the latter, are they situated in the nerve and neuralgic, or in the muscle and myalgic? We have had writers who have contended strongly for one view or the other, but in all probability both are correct. I think, however, we are much indebted to those physicians whom I have before mentioned who have directed attention to the frequent existence of myalgic or myosalgic pains. Thus, the pains in the side and in the head so frequently met with are said to be muscular, and more especially the pains which occur in the chest or abdomen. Two good cases of the kind I now have under my care in Mary Ward. The one a young girl who lies in bed or sits in a chair, leaning forward, complaining of great pain at the epigastrium. She cannot bear it touched, and says she feels as if a load were oppressing her, and which will presently suffocate her. She is sometimes so bad that her mother thinks she will die, but at the same time she is well developed,

stout, and has apparently no real disease upon her. The other case is that of a woman well known to all students on account of the trouble which she has imposed upon them. Before she came under me she was in charge of one of my colleagues for several months. Her complaint is a most excruciating pain at the left side of the abdomen, which draws her double, and which hitherto has not succumbed to the medicines which have been taken in vast quantities. The only relief she has obtained has been by the subcutaneous injections of morphia, which have now been practised for many months. The woman is in good condition, and does not look as if she suffered from any organic disease. On examination of the abdomen, the left side is full, rather rigid, and highly sensitive when touched. She complains, when the paroxysm of pain is on, of a most distressing bearing down and irritability of the bladder. She stated that she had passed blood in her water, and thus the case was treated as one of calculus of the kidney and ureter. At the present time opinions are divided between this diagnosis and one of hysteria, where the pain is due to a spasm of the abdominal muscle. My own opinion inclines to the latter view, perhaps being somewhat prejudiced by the fact that the great master Sydenham takes such a case as illustrative of one of the forms of hysteria, and which I will read:—"When this disease seizes one of the kidneys, it plainly represents, by the pain it causes there, a fit of the stone, and not only by that sort of pain and by the place it rages in, but also by violent vomitings which accompany it, and also for that the pain sometimes extends itself through the passage of the ureter; so that it is very hard to know whether these symptoms proceed from the stone or from some hysterick diseases, unless perchance some unlucky accident disturbing the woman's mind a little before she was taken ill, or the vomiting up of green matter, shows that the symptoms rather proceed from an hysterick disease than from the stone. Neither is the bladder free from this false symptom, for it not only produces pain there, but it also stops the urine just as if there were a stone, whereas there is none. But this last kind seizing the bladder, happens very seldom, but that which resembles the stone in the kidneys is not so rare."

Then, besides hysterical pains, we have disturbances of all the various organs of the body. Palpitation of the heart is very frequent. Then the breathing may be affected, and we have a kind of nervous asthma. The larynx may be affected; at one time there is a want of power to articulate, and neurophonia is one of the commonest symptoms of the hysteric condition. At another time the larynx is over-sensitive, and we have that troublesome and most annoying symptom, the hysteric cough. Some, however, have considered this due to a kind of chorea or spasm of the diaphragm. You may recognise it by the loud hollow or barking character, want of expectoration and any evidence of disease of the chest, or, to give the description in the words of Sydenham, which is both precise and accurate:—"Sometimes it (the hysterick disease) seizes the lungs, and the patient coughs almost without intermission, but expectorates nothing; and though this sort of cough does not shake the breast so violently as that which is convulsive, yet the explosions are much more frequent."

Sickness is one of the most troublesome and obstinate of all hysteric disorders, because the organ having got into the bad habit of discharging its contents upwards can with difficulty be broken of it. It is remarkable that in these cases of daily vomiting the characteristic of the hysteric condition, the plumpness or absence of emaciation, still persists. One mode by which we diagnose such cases as hysteric is that no medicine is of any avail; in real disease, even in such organic maladies as cancer, or ordinary remedies afford relief, but here the cure must be attempted through the nervous system. I believe the best method is to starve the patient for a while, or to use injections, so as to preserve the stomach in absolute quiet for some days, and then to commence with the smallest quantities of food.

The bowels again, are, to use Sydenham's expression, seized upon by hysteria. Thus, prolonged and obstinate constipation is a not uncommon phase of the disease. This is only to be cured by the medical man having his patient well in hand, and by letting her know that he is quite aware of

the want of importance of her malady. The regular plan is for such a patient, like others of the kind, to be taken from doctor to doctor, who write the usual prescriptions, and with the usual results. The influence which can be produced on hysterical patients by physicians and attendants is well seen by some of the cures which occur under the direction of one of our "sisters," who introduces herself to her patients with "No nerves in Esther Ward."

As regards the nervous influence on the kidneys in the production of a large amount of water, the fact is one of importance in a diagnostic point of view. Sydenham says:—"Among all the symptoms which accompany the disease this is the most proper and almost inseparable—viz., a urine as clear as rock-water, and this hysterick women evacuate plentifully, which I find by diligent inquiry, is in almost all the pathognomonick sign of this disease, which we call hysterick in women and hypochondriack in men; and I have sometimes observed in men that presently after making water of a citron colour (yea, almost the next moment), being suddenly seized with some violent perturbation of the mind, they presently void water as clear as crystal, and in great quantity. Three years ago a nobleman sent for me who seemed to be suffering from an hypochondriack colick. Visiting him one day, I looked upon his urine, which was of a citron colour. He was then merry and cheerful, and said he had a craving appetite; but one coming in at that very moment vexed him so much that suddenly being taken ill he called for a chamber-pot, which he almost filled with urine as clear as crystal."

Indeed, if I were to detail all the disturbances to which the body is liable in hysteria, I might occupy you for a month, or, to quote Sydenham once more, "Nor is this disease only frequent, but so strangely various, that it resembles almost all the diseases poor mortals are inclinable to. For, in whatever part it seats itself, it presently produces such symptoms as belong to it, and unless the physician is very skilful he will be mistaken, and think those symptoms come from some essential distemper of this or that part, and not from any hysterick disease."

I can scarcely tell you how to treat these people. Occupation and diversion for the mind are no doubt the most essential elements in any treatment, but they are just those which you cannot enforce. The worst part of the therapeutical system is this, that not only will the patient not take your advice, but by prescribing for him you are assisting in perpetuating his illness. You might think that a patient who was always ailing and got no relief would not trouble medical men any further, but it is very remarkable that it is that very man who takes our physic. He will sit down and tell you of the number of medical men he has seen, and show you a bundle of prescriptions, declaring that they have done him no good, and yet he will ask for another.—*Medical Times and Gazette, March* 27, 1869, *p.* 323.

15.—ON MURIATE OF AMMONIA AS A REMEDY FOR SOME NERVOUS DISORDERS.

By Dr. Francis E. Anstie, Editor of "The Practitioner."

[Few agents have more decided and reliable therapeutic properties than has muriate of ammonia. The apathy with which it is regarded in England contrasts singularly with the varied uses to which it is applied by German physicians. It has the reputation in Germany of being a uniform stimulant of all the secretions. Dr. Anstie has had considerable clinical experience of its employment for the relief of various kinds of pain; and of certain cases of suspended secretion dependent on nervous exhaustion.]

The anodyne action of muriate of ammonia has not been so neglected as it is for want of empirical observations, by various authors, sufficiently striking to have arrested attention. The practical unfruitfulness of these observations must be laid chiefly to the blame of the mischievous metaphysical conception of pain as a mode of *heightened vital energy*, which rendered it difficult for

the popular intelligence to understand the applicability of ammonia—usually considered a stimulant *par excellence*—as an anodyne. So widely prevalent, even now, is this fundamental misconception, that nothing but stubborn facts in large array can break it down. Fortunately such facts can be produced in any number, and, in the case of muriate of ammonia, they have presented themselves to me in overwhelming force.

Foremost in the list of painful affections for which the muriate is useful are the group of disorders now classed under the term Myalgia, which was invented by Dr. Inman. The out-patient clinic of a hospital presents an excellent field for the study of these affections, and at Westminster they present themselves in very large numbers. The general type is that of aching pains felt in muscles which are habitually overworked in proportion to their nutrition; such pains are naturally commonest in laborious and ill-fed persons. The most exquisite examples are, perhaps, seen in shoemakers and sempstresses, who (often with insufficient food) work many hours a day in cramped positions which keep certain muscles of the trunk in a permanently contracted state. Myalgia of the intercostals, and of the recti abdominales, frequently attacks these persons with great severity. Theoretically, of course, the one all-paramount indication of treatment should be *rest* to the overworn muscles. Practically, this is often impossible, and some other remedy has to be found. I have tried all manner of remedies to this end, and have come to the conclusion that nothing in the whole list of them comes near to muriate of ammonia in efficiency. Several authors have spoken favourably of its action in myalgia. I give it in doses varying from ten to twenty grains, and can say that not even quinine in ague is a more reliable agent than the muriate in myalgia. Of course it quite fails in a certain percentage of cases; and of course, in a still larger percentage, the hostile influences balk a perfect cure. But the total or partial failure of quinine in intermittents is quite as frequent an occurrence.

The neuralgias proper require a special classification in relation to their amenability to the muriate. First on the list, by very much, stand *migraine* (or one-sided headache, ending, if it lasts long enough, in vomiting) and so-called *clavus hystericus*. In estimating the value of any remedy for neuralgias like migraine and clavus, it is necessary to take into account the history of those affections and the place they occupy in pathology. The unfortunate term "sick-headache" popularly applied to the one, and the equally luckless adjective "hysterical" employed in speaking of the other, for a long time fatally confused the subject. They brought about this result, namely, that the pain in the head, in each case, was tacitly considered as merely secondary to some other affection—of the stomach in the one case, of the sexual organs in the other—instead of being recognised as what they certainly are, distinct and primary neuralgias of the fifth cranial nerve, of a kind which belongs *especially to the period of bodily development*. Hence migraine and clavus have, time out of mind, been made the occasion for every description of meddlesome and useless, and often actively mischievous, medication, directed to the removal of a "biliousness," or an imaginary "hysteria." The distinct recognition of these kinds of headache, as the *facial neuralgias of the young*, clears our way towards a frankly neurotic treatment of them; and under these circumstances, in accordance with the principles now coming into general adoption, the following lines of treatment lie before us. There is the improvement of nutrition of the nervous system by various means; an object of special importance in neuralgias which are connected with the period of bodily growth. There is the employment of counter-irritation; a matter which is of less importance in this case than in that of other neuralgias: and finally, there is the employment of a variety of internal remedies which produce visibly direct and rapid effects upon the nervous system.

Among the latter class of agents there is every variety of applicability to the treatment of different neuralgias. Migraine and clavus rank decidedly among the milder varieties of neuralgic pain; that is to say, they are not in themselves either so intolerable or incurable as many others. They are distressing enough while they last, but the attacks usually tend to spontaneous

termination, or at least great remission by the occurrence of sleep. Of agents which directly affect the nervous system, therefore, it would seem probable that the milder stimulant class, which tend simply to restore interrupted function to its natural level, would be most suitable to cut short the attacks of such a neuralgia in its commencing stage. Salts of ammonia naturally suggest themselves, as highly *diffusible* stimulants, as likely to effect this purpose. After very numerous trials I have come to the conclusion, that though the preparations of ammonia are generally available, the muriate, in doses of ten to twenty grains, is very much the best; and in fact, if given early enough, seldom fails to cut short or greatly mitigate an attack. I need hardly say that among the out-patients of a hospital numerous hard-worked and delicate young women present themselves, who suffer from one or other of the forms of headache now referred to; and the efficacy of the muriate of ammonia treatment in my practice at Westminster Hospital has now become a fact of which the clinical clerks and students are well aware.

With less remarkable frequency, but still pretty often, I have observed the good effects of muriate of ammonia in *intercostal* neuralgia. I am not now speaking of the very severe and intractable form of that complaint which often attends, and in some cases continues long after, the eruption of herpes zoster; but of the much commoner form which is apt to occur in suckling women, and in some phthisical patients. In suckling women a very painful neuralgia often occurs, the principal site of which is a point or points in one or more of the intercostal spaces, an inch or two below the left nipple. In phthisical patients intercostal neuralgia is also rather common, but is not so limited as to the place of its maximum intensity; for it may occur on either side, and in any of the intercostal spaces. In both these varieties of intercostal neuralgia the use of muriate of ammonia is very frequently of striking benefit, pain being relieved in half an hour. It must be confessed, however, that the remedy is not successful in so large a proportion of the neuralgic, as of the myalgic affections of the chest-wall.

Neuralgias of the lumbo-abdominal nerves are occasionally benefited by the muriate, but only temporarily; in marked contrast with the prompt and permanent relief which this remedy so frequently affords to the myalgic affections of the lumbar and abdominal regions.

In sciatica there is a broad line to be drawn between the cases that may, and cases that may not, be benefited by muriate of ammonia. This medicine is generally applicable, as an anodyne stimulant, to those milder varieties of sciatica which occur in young persons whose health has not been profoundly shattered, and especially in cases that are recent. In such affections the influence of the drug, though nothing like so important and essential a feature in the case as it is in that of myalgia and of many cases of migraine, is decidedly good. But in cases of long standing, and especially in those cruel and inveterate types of the diseases which commence in the later periods of life, and are coincident with a progressive degeneration of the arteries and of the tissues generally, the muriate of ammonia is ineffective. Nor have I found it of any value in the truly *rheumatic* varieties of sciatica, although some authors have especially recommended it in these cases. I have elsewhere stated that in truly rheumatic cases I believe the mischief to be of an inflammatory character, and to have its origin and essential seat in the sheath and surroundings of the nerve, which becomes thickened, and, as it were, hypertrophied. Limiting the title 'rheumatic' strictly (and as I believe properly) to such cases, I do not find that the muriate of ammonia has any genuinely beneficial effect upon them; while, on the other hand, the iodide of potassium does appear to be singularly useful: and, indeed, I believe it is only in this kind of neuralgia that the latter remedy can be at all depended upon to produce good results.

Of the effects of muriate of ammonia in the deeper-seated neuralgias—those which attack internal viscera—I can only speak with cautious reserve, seeing that the diagnosis of neuralgia in these situations is always surrounded with difficulty. In neuralgias of the *heart*, the best-marked members of the group, I confess that I have never been inclined to rely upon

them, and consequently have made no experiments which are worthy of being recorded; for the imminence of the danger connected with this kind of affection has always predisposed me to make use of remedies as to which there is strong evidence that they exert a powerful influence over the nervous apparatus of the heart. Sulphuric ether in the emergency of the actual paroxysms, and arsenic and strychnia as prophylactics, have appeared more worthy of persistent trial in these very serious diseases. Adding opium to the list, I am inclined to say much the same (although here the element of danger to life has not to be considered) in the case of *gastralgia*. In ovarian neuralgia, however, a sufficiently common and a very distressing malady, I have once or twice seen full scruple doses of the muriate produce remarkable relief; though here, again, the action of ether, and still better of morphia, or of atropine subcutaneously injected, is usually found to be a far more certain and direct means of quieting the pain. There is one variety of visceral neuralgia, however, which, though much less common than the kinds now mentioned, indisputably exists, and is, moreover, very troublesome and rebellious to ordinary anti-neuralgic treatment—viz. *hepatic*. No doubt there has been a great deal of vague and incorrect writing about hepatic neuralgia, the result of inexact diagnosis; but there are perfectly typical cases of the disease. The patient with or without any obvious bilious disturbance, suffers from severe pain of the true neuralgic type, deep in the region of the liver, with intermissions of perfect ease; there are no inflammatory symptoms, and on examination we discover no sign of organic alteration. Sometimes the pain is limited to the immediate region of the liver; in other cases it extends towards the shoulder, as in many other liver affections. According to my experience nothing is more obstinate than such a case as this. Quinine and arsenic are either ill borne by the stomach, or, if they create no disturbance, at least effect little or no relief. But here the muriate of ammonia, in ten or fifteen grain doses, really acts "like a charm," cutting short the attack promptly, and also seems to dissipate the tendency to neuralgia.

The mention of muriate of ammonia as a remedy for hepatic neuralgia conducts us very naturally to the consideration of another characteristic action of the drug, which is really of very great value. Although I cannot, from any experience of my own, confirm the statements of various continental authors as to the effects of the muriate upon secretion generally, with regard to the secretion of *bile*, when suppressed under certain circumstances, I am convinced that this medicine is the most powerful of all functional restoratives which I have met with. There is a very familiar class of cases of acute jaundice, the origin of which can be distinctly traced to strong *nervous perturbation*. There are certain persons, of markedly neurotic tendencies, who, throughout their lives, are liable to suffer from severe nervous disturbance of one kind or another, when they receive any considerable shock, either mental or bodily. Many of these subjects are liable to headache of a neuralgic type; a majority, perhaps, are women, with either hysterical or choreic tendencies. A severe nervous shock, such as that of fright, or more surely still the persistent influence of a deep and growing anxiety, such as that which preys on the mind of an unfortunate girl of respectable connexions, who has been seduced and deserted, and finds herself pregnant,—such powerful disturbing emotional influences as these have frequently been known to suppress the excretory function of the liver in a very complete and dangerous manner, dangerous not merely from the toxic effect upon the blood, but from the intensely depressed condition of the nervous energy generally. The whole class of so-called cholagogue aperients are much more than merely inert for good in such cases, they are most actively harmful; and, by consent of all good authorities, a reviving and stimulant treatment is allowed to offer the only chance of good from direct medication. Any ammoniacal preparation will be useful, and I have seen good effects produced by the bicarbonate, by sal-volatile, and also by acetate of ammonia, in doses smaller than those required to produce diaphoresis. But the muriate is by far the most effective preparation; and, indeed, I have seen several instances in which two or three doses of twenty grains, given at intervals of four hours,

have produced a decided change, and a marked recommencement of biliary excretion.

A much more doubtful matter, as to which, nevertheless, I am not prepared even to lean with any strength towards the negative, is the reputed *emmenagogue* influence of muriate of ammonia. There are probably very few physicians educated in the ideas of recent therapeutics, who believe in anything like *specific* emmenagogues—that is to say, in remedies which in all circumstances, exert a more or less powerful and direct influence in the direction of provoking the menstrual flow. And although there are probably as few practical physicians who do not believe that there are several medicines which, given under exactly the proper and favourable circumstances, do appreciably assist the function in question, yet it cannot be disputed that there is always immense difficulty in deciding the exact degree in which this action has been curbed in any particular instance. It is abundantly clear that such remedies as iron only act by improving the quality of the blood and the general tone of the nervous system, and it is extremely doubtful if such medicines as aloes, either alone or in combination with iron, have any more than this effect, with perhaps the added advantage, in particular cases, of keeping the intestines unloaded, and thus removing a source of frequent mechanical pressure. Of ergot of rye, and one or two remedies physiologically allied to it, it seems as if we were justified in speaking rather more strongly; and it remains doubtful, as far as my experience goes, whether muriate of ammonia may not ultimately prove also to possess a real influence upon the pelvic sympathetic nerves, which approximates its effects to those of the former drug in this particular direction. Given in ten-grain doses thrice daily, in cases of amenorrhœa marked rather by general feebleness than by anything like anæmia, it has occasionally seemed to me to conduce directly and considerably towards the cure. But of this, as of all other emmenagogues, it is pre-eminently true that they are worth absolutely nothing unless used precisely at the fit occasion.

In concluding this paper we may remark that there is not one fact mentioned in it that does not point to the nervous system as the *locus in quo* of the therapeutic action of the muriate of ammonia. The relief it affords in myalgia, or in suppressed secretion, is surely as directly nervous as its anodyne effect in pure nerve-pain. It appears, in fact, when given in therapeutic doses, to be a pure tonic stimulant to sensitive nerves, raising them to a level of tense vitality *too high* for the explosive perturbations which, when carried to the brain, are translated as *pain*, and to the vaso-motor system, directly inciting to a superior tone of the systemic vessels, which puts an end to that exaggerated passive congestion of viscera which is known to be fatal to the healthy performance of the function of secretion. —*Practitioner*, *Dec.* 1868, *p.* 357.

16.—ON THE USE OF THE BROMIDE OF POTASSIUM IN THE TREATMENT OF SOME NERVOUS AFFECTIONS.

By Dr. James Turnbull, Physician to the Liverpool Royal Infirmary.

[A most singular and interesting discovery has been recently made with regard to the therapeutical action of some of the vegetable alkaloids. It is found that by altering their constitution, so that they are changed from nitrile to ammonium bases, their actions are so completely changed that we might say they are reversed.]

The experimental researches of Dr. A. Crum Brown and Dr. Thos. R. Fraser have now actually proved what was here anticipated in 1854, and ...e demonstrated that certain properties are common to members of a ...s; for, by converting strychnia, brucia, thebaia, codeia, morphia, and ...ia, which are nitrile bases, into ammonium bases, by the addition of ...e of methyl, they not only reduce the poisonous properties of these

alkaloids, rendering them comparatively innocuous, but they entirely change their action on the nervous system; so that, whereas several of the nitrile bases, more particularly strychnia, cause violent spasmodic muscular contractions, the ammonium bases—for example, the iodide of methyl strychnium—paralyse the spinal motor nerves, and cause muscular relaxation. "We may conclude," they observe, "from these facts, that, when a nitrile base possesses a strychnia-like action, the salts of the corresponding ammonium bases have an action identical with that of curare."

This is not only a most important discovery, but it shows what great results in the elucidation of the *modus operandi* of medicinal agents may be expected from well directed enquiries, aided by the light which the present advanced state of organic chemistry can throw on the subject.

[Passing on to the therapeutical uses of bromide of potassium the writer observes:]

The therapeutical use of the bromide of potassium, which I wish more particularly to notice, is the power which it has of producing sleep when administered in full doses. There is no medical man in extensive practice who has not in various cases experienced much difficulty in overcoming the troublesome symptom of sleeplessness, and felt the want of an efficient remedy in cases where opium could not be used. Though opium is one of the most valuable remedies in the Materia Medica, we all know from experience that it often causes increased restlessness instead of sleep, and produces various consequences, such as constipation, headache, &c., which render it altogether inadmissible with some patients. Though morphia is less liable to produce such unpleasant consequences, it is not free from these objections; and the various other derivatives from opium which have from time to time been brought into notice, such as the sedative solution of opium, chlorodyne, nepenthe, &c., are none of them entirely free from the objectionable effects of the parent drug.

When sleep is prevented by pain, arising from some abnormal physical condition of the body, opium in some of its various forms is the grand remedy; and, if we except chloroform, it has no rival as a sleep-inducing agent in this class of cases, but there are others where the want of sleep arises from mental rather than from physical pain, or from trifling causes exciting a morbidly sensitive nervous system. In the latter, opium often prevents, instead of inducing sleep, and causes its after effects in an aggravated degree. I have tested the bromide of potassium in some cases of the latter description, and being convinced that it is a remedy of power, and one the value of which is scarcely yet generally known by medical men, I shall briefly give some details of a few cases of this description in which I have used it with advantage.

Brown-Sequard was, I believe, the first to point out the value of the bromide of potassium in inducing sleep, and to show the mode of giving it, and the kind of cases in which it is most likely to prove of service. In one of his lectures on the recent advances of our knowledge in the diagnosis and treatment of functional nervous affections, he says, "It is of the utmost importance to improve the sleep, which is generally bad in persons attacked with a morbid increase of the reflex excitability. For this purpose an invaluable remedy has recently been discovered; it is the bromide of potassium. Except when pain is one of the causes preventing sleep (in which case opium, aconite, and belladonna should be employed together), I have found that this remedy has a wonderful power to produce quiet and refreshing sleep, without any drawback that I am aware of. I usually give to adults a dose of thirty grains of that salt a quarter of an hour before the last meal, and a second dose of from thirty to fifty at bedtime. In cases in which, without any nervous complaint, there is sleeplessness, owing to some cause of cerebral excitement, as well as in all neuroses, excepting hydrophobia, tetanus, very severe cases of delirium tremens, and some forms of insanity, sleep is almost always induced by that remedy."

Dr. Behrend has published in the Lancet some cases in which he gave the remedy with great advantage. It was, however, from reading Brown-

Sequard's lecture that I was first induced to make trial of it, and I shall now refer to some of the cases in which I have given it.

Case 2.—I frequently attend a gentleman, about 68 years of age, of nervous temperament, who has for many years had slight facial paralysis, and who had about ten years ago, and subsequent to the facial attack, a very severe nervous attack, with some head symptoms. He suffers habitually from constipation, and at times from dyspepsia, with flatulent painful sensations at the stomach, which often deprive him of sleep for many successive nights. In this case I have found that nothing affords so much relief as the bromide of potassium, which he takes when troubled with these symptoms in half-drachm doses, one about seven o'clock in the evening, and again at bedtime, with the effect of inducing sleep without the least unpleasant consequence.

The three next are cases of delirium tremens, and in the first of them opium had been freely tried without success, but sleep was readily induced by the bromide, given in half-drachm doses every four hours until two drachms had been taken. The second was a very violent case, where the remedy was administered in the same way, until seven drachms had been taken, but, with each of the last half-drachm doses of the bromide, a pill with one grain of opium was likewise given. After that, sound sleep was induced; and the symptoms rapidly abated. The third was a milder incipient case, where the bromide alone in moderate quantity sufficed to calm the nervous excitement and induce sleep.

Case 3.—The patient was a gentleman about 34 years of age, of dissipated habits, who had several times suffered from delirium tremens. I saw him, in consultation with Mr. Byerley, who had given opium largely without effect. The symptoms were like those of typhoid delirium; there was profuse perspiration, and the pulse was very weak and rapid. He had picking of the bed-clothes, and was quite unable to understand or reply correctly to questions. We ordered half a drachm of the bromide of potassium to be taken every four hours till he slept. After the fourth dose, which was taken about two o'clock in the morning, he fell asleep, and slept for five hours. He awoke quite conscious, and when I saw him about midday all the symptoms were better, and he soon got quite well.

Case 4.—I was summoned to see, in consultation, a gentleman about 38 years of age, who had on several occasions suffered from attacks of nervous excitement, his habits having been intemperate for several years. He had the usual symptoms—restlessness, tremor, profuse clammy perspirations, and no sleep for three nights. He was quite delirious, and saw imaginary objects, but talked rationally for a few seconds, and then wandered quite incoherently. The pulse was very weak (94), and the hands very unsteady. He had been freely purged, and I at once prescribed half-drachm doses of the bromide, with aromatic spirit of ammonia, every four hours, the alcoholic stimulant being limited to six glasses of sherry, which, however, he overstepped. The following day he was still incoherent, but less excited, and more manageable. As he had not slept, the bromide was continued, and he was ordered to have with each dose one grain of opium. The next morning he went to sleep at half-past six, and slept soundly for four hours. He awoke at intervals during the day to take food, but no further sedative was needed, as he became perfectly quiet and rational; and, having slept the third night, he was quite convalescent on the fourth day from my first visit.

Case 5.—A gentleman, 33 years of age, a wine and spirit merchant, of nervous temperament, and rather irritable digestive organs, came under my care, suffering from vomiting. He was tremulous, perspiring, and had the frightened look of one who was suffering from over stimulation, though from constant tasting, rather than habits of intemperance. He had no delirium, but had suffered from restless, sleepless nights, as well as the vomiting. Having purged him with podophillum and aloes, I gave him fifteen grains of bromide of potassium, with aromatic spirit of ammonia, three times a day, and half a drachm of the bromide at bedtime. This treatment soothed the nervous excitement, and produced sleep, and in a few days he got quite well.

Case 6.—In the first number of this journal, I published the case of a woman, 26 years of age, who had hemiplegia, preceded by convulsions, and where sleeplessness was a prominent symptom. She was most urgent in asking for something to make her sleep, not having slept at all for many nights, and being greatly exhausted by want of rest. Fifteen grains of the bromide were ordered to be taken at six in the evening, and again at nine o'clock. She slept the first night, and after taking it in this way for a few days, there was no further need of the remedy. She also recovered completely from the paralysis of the side.

These cases will suffice to show any one that may not have used the bromide in full doses to overcome sleeplessness, that it is a valuable remedy, which may be safely administered for this purpose in a variety of nervous affections.

The bromide has been used with more or less benefit in many other nervous disorders, such as mania, hypochondriasis, chorea, vertigo, headache, and local affections. I gave it lately with very good effect to a young lady who had long suffered from hysterical difficulty in swallowing. Dr. Begbie states that he has prescribed it successfully in some cases of diabetes; and Dr. J. Russell Reynolds has given it with great advantage in certain nervous affections characterised by sudden, distressing, but indefinable feelings in the epigastrium and abdomen, which he attributes to disturbances of the vaso motor system. A case, which might be embraced in this group of anomalous nervous affections, and where there was disturbance of the circulation in the head, with uneasy sensations in the abdomen, was quickly removed by bromide of potassium, after other means had been resorted to ineffectually.

Case 8.—A gentleman, about 45 years of age, came under my care, who had formerly been stout and plethoric, at which time he suffered much from bleeding piles, but had for some years become less stout and had almost ceased to be troubled by the piles. He had distressing sensations at the epigastrium, loss of appetite, and flatulence, but he was most alarmed by some head symptoms, pain, giddiness, and floating specks before his eyes. There was no heat, increased action of the vessels, or any sign of determination of blood to the head, but, on the contrary, the pulse was very weak, and the countenance paler than natural. He took steel with ammonia, but, still suffering from the same symptoms, he went to Harrogate for ten days, and took the saline sulphur aperient water, which improved the condition of the digestive organs, but did not remove the uneasy sensations at the epigastrium, or in any degree diminish the head symptoms. On his return I prescribed 12 grains of the bromide, to be taken three times a-day, in a tonic infusion, with some aromatic spirit of ammonia. This had an immediate effect, in relieving all his symptoms and improving his appetite also, and within four days he said that, whereas he had been quite unfit for any business, he felt fresh energy and was able to face anything.

I shall now advert to what has been called bromism, or the effects which may be produced by the excessive use of this salt when it is taken in full or considerable doses for long periods. The following case is a good illustration.

Case 9.—A lady, about 47 years of age, whom I had previously attended occasionally, came under my care in November, 1865, on account of pain at the stomach and vomiting. There was constipation and very dark coloured motions, which seemed to be coloured by blood, as they got blacker by purging. On examination of the epigastrium, a tumour the size of a small egg, was found in the situation of the spleen. She was seen by Dr. Vose also, and we both thought it might prove of malignant nature. By blistering, however, attention to diet, and other means to relieve the dyspeptic symptoms, and finally by the use of cod liver oil, which improved the general health as it had often previously done, the tumour gradually decreased, so that towards the end of the year it could scarcely be discovered. In the spring she went to Edinburgh, and put herself under the care of one of the leading physicians there, who prescribed bromide of potassium, the dose of

which was increased to about a scruple thrice a day. She was more or less under his care all the summer and autumn, and she was so strongly impressed with the belief of the necessity of its continuance for the removal of the tumour, or what remained of it, that she clung to it with great tenacity. She lost her father in the autumn, and at that time her health was so bad that it was thought she could not long survive. In November, 1866, she returned to Liverpool, but did not place herself under my care for a fortnight after, as she did not wish to have the treatment of her Edinburgh adviser interfered with. Her friends, however, found that she was getting extremely weak and ill, and I was therefore sent for. I found her very emaciated and weak, and of a peculiar pallid colour. She was also inclined to doze, so that she often dropt off to sleep. There was remarkable slowness of speech, and difficulty in collecting the ideas and expressing them. The extremities were cold, and the pulse slow and very weak. She was fearfully depressed, and frequently shed tears. There was no tumour whatever to be felt, and therefore no indication for continuing the bromide. The symptoms were such as might have been partly due to malignant disease, but I thought they were chiefly caused by the protracted use of the bromide, and I insisted on it being relinquished. I improved the diet and gave stimulants and tonics, with cod liver oil; in fact, returned to the original treatment she had left off on going from Liverpool. The rapidity with which she recovered, getting colour, strength, flesh, and spirits, was surprising, and showed me that her condition and symptoms were entirely due to the excessive and protracted use of the bromide. She has continued perfectly well.

I was not then aware that Dr. Bazire had described a condition precisely the same, which was induced by the protracted use of the bromide of potassium. "When given," he says, "in large doses, such as thirty or forty grains, two and three times a day, it produces very striking symptoms in about ten or fifteen days. The patient at first complains of a dull headache, becomes listless and apathetic, with an expressionless face and lustreless eye. His intellect is clouded, his mind confused, and he is unable to concentrate his thoughts. There is slowness of perception, and questions have to be asked several times before their meaning is understood and an answer can be obtained. If, when these symptoms have begun to show themselves, the medicine be continued, hebetude follows, with inability to think, and a kind of stupor resembling that of the first stages of typhoid fever, together with drowsiness, somnolence, and constant dropping off to sleep. In no case have I seen delirium or hallucinations. The pupils are dilated, and contract very sluggishly under the influence of a strong light; the sensibility of the conjunctiva is so deadened that a finger may be passed with impunity over the surface of the eye-ball without producing winking. Hearing loses its usual acuteness, and it is only by speaking in a very loud voice that the patient can be roused from his stupor."

These symptoms are similar to what I witnessed in the preceding case; and Dr. Bazire has described effects of a less severe character, but with an eruption of boils, occurring when the bromide is taken for much longer periods, in ten to fifteen grain doses, twice or thrice daily.

The chief object of this paper having been to give practical illustrations of some of the uses of bromide of potassium, I shall not enlarge on its *modus operandi*. It would seem, however, that it produces a direct sedative effect on the whole nervous system, especially the sensory and motary nerves, and that it has a power of controlling irregular vascular action. According to MM. Damourette and Pelvet, it acts as an anæsthetic on the nervous centres and cord on the one hand, and on the mucous and tegumentary surfaces on the other. It diminishes muscular irritability, and thus has an extensive effect on the muscular organs of digestion, respiration, and urinary secretion, as well as the striated muscles.—*Liverpool Medical and Surgical Reports, Oct.* 1868, *p.* 9.

17.—AMERICAN CONTRIBUTIONS TO THE STUDY OF CUTANEOUS NEUROSES.

By Dr. H. S. Purdon, Physician Belfast Dispensary for Diseases of the Skin; Assistant Physician Belfast Charitable Infirmary, &c.

Neuroses of the Skin.—In the early part of last year a distinguished American dermatologist, Dr. Howard F. Damon, published a monograph on "Neuroses of the Skin," which work has been favourably mentioned by Dr. Brown-Séquard.

In the introductory chapter our author informs us that neuroses of the skin are caused by peculiar conditions, either of the sensitive or of the vaso-motor nerves. The sensibility of the former may be exalted or diminished to a variable extent. Spasm and paralysis are the peculiar forms of derangement of the vaso-motor nerves.

The first disease treated of is "Dermalgia," manifested in the form of tenderness, or increased sensibility to touch, and is generally confined to a limited portion of the skin. Sometimes, however, it involves the integument of one side of the body—usually the left—or even the whole skin. "The skin is either painful to the touch only, or the pain may be spontaneous and independent of contact with any sensible object. In other instances a draught of air may be sufficient to excite this pain, or the threatened contact with any material substance. Dermalgia appears to be of two kinds as regards cause—the hysteric and rheumatic. That form which is associated with hysteria is usually confined to the left side, and is often extensive; sometimes, however, only small areas of the skin are endowed with this exquisite sensibility to external impressions. These are veritable neuralgic spots . . . . This irritation may have its origin in unhealthy conditions of the uterine organs and the sympathetic troubles to which they give rise. When this hyperesthesia to touch is more general and of a severe character, it has been regarded as one of the indications of commencing myelitis, or of inflammation of the membranes of the spinal cord. There is a rheumatic form of dermalgia which is confined to a limited portion of the skin, and which is encountered frequently in practice. It consists in an excessive tenderness to the touch, and sometimes pain. When the latter symptom is present, alteration in the nutrition of the part speedily takes place. The skin often becomes red, and there is slight engorgement of its tissues. The tender spot occasionally occupies a portion of the integument supplied by filaments of some large cutaneous nerve. The disease appears to be due—for the most part, however—to a morbid condition of the sensory apparatus of the skin . . . . Dermalgia has been observed to be more frequent in those regions which are occupied by hairs or lanugo than elsewhere. The arrangement of the hairs upon the surface of the body corresponds somewhat with the general distribution of the cutaneous nerves."

The rheumatic variety of this painful affection is usually of an intermittent character—worse at night; and in course of time the nerves themselves appear to become inplicated. It is often complicated with muscular pains.

In the treatment of dermalgia our author recommends the application of blisters, the linimentum ammoniæ and belladonna. Internally hyoscyamus, combined with valerianate of zinc, and states that the efficacy of the valerianates has been confirmed by many practitioners, amongst whom Dr. Silas Durkee, of Boston, is specially mentioned. If the patient is sleepless he administers the bromide of potassium in very large doses, such as from thirty to sixty grains, at bed-time, and which, we are informed, quiets the nervous excitement of the patient, thereby insuring sleep. If the insomnia persists the hypodermic injection of morphia is recommended. Where there is much debility present the bromide of ammonium is to be preferred to the similar preparation of potassium.—*Dublin Quarterly Journal, Feb.*, 1869, *p.* 98.

18.—SULPHATE OF NICKEL IN NEURALGIA.

The interest of the following remarks does not lie in the employment of the sulphate of nickel in neuralgia, but in its therapeutic effects. We are told that it is a gentle tonic, acting like the preparations of iron and quinia. In this case, however, it seemed to exercise a sedative influence, more closely resembling that of the bromide of potassium.

Mrs. B. has suffered with neuralgia more than three years. During the last two months the paroxysms have been very violent and frequent—occurring every few minutes. She has taken iron, quinine, arsenic, strychnine, colchicum, aconite, morphine, chloroform, valerian, zinc, mercury, electricity, and many other remedial agents, with only temporary relief. As Prof. Simpson had used the sulphate of nickel successfully in a case of severe and obstinate periodic headache, I concluded to try it, and began February 19th by giving her half-grain doses three times a day. In less than a week the paroxysms were reduced to only one within twenty-four hours; this came on at noon. On last Sunday (March 1st) it did not commence until about 3 p.m. I was present and gave one grain of the sulphate, notwithstanding she had taken her regular doses that day. Its sedative action was speedily manifested in reducing the pulse and producing sleep. All symptoms of the paroxysm disappeared, and Mrs. B. states that they did not return until 7 o'clock. In this case the sulphate of nickel has given more permanent relief than anything else; Mrs. B. tells me that it soothes her quicker than morphine, and is not followed by any unpleasant effects.—*Medical Press and Circular, Dec.* 30, 1868, *p.* 562.

19.—ON HEMICRANIA, OR SICK HEADACHE.

By Dr. Samuel Wilks, Physician to, and Lecturer on the Practice of Medicine at, Guy's Hospital.

[Hemicrania, or sick-headache as it is generally called, is of a dull and sickening character. Its great peculiarity is the throbbing which occurs with each beat of the heart, aggravated by every movement of the body, and more especially of the head itself.]

Now, as to the cause of this misery, I have already said that whilst the body is cold the head is hot, and that whilst the radial artery is small the carotid is full; in fact, if the term determination of blood to the head is applicable to any malady it is assuredly to this. This irregularity in the circulation due to nervous influence has created much interest of late years, as I have already told you in describing various diseases. It has been clearly shown that the blood-vessels are regulated in calibre by the sympathetic nerves, and that the supply of blood is immediately under nervous control. Now in this complaint of which I am speaking, the carotid on one side with its branches is dilated, throbs inordinately, and sends too much blood to the brain and its coverings. The fact I knew when quite a boy, for when leaning my head on my hand I distinctly felt the increased size of the throbbing temporal artery on the side of the pain, which would be sometimes on the right and sometimes on left side. I remember mentioning the circumstance to more than one medical man, and they received the statement with incredulity. I knew it, however, to be a fact, nevertheless, and am sorry to say I have been too fully aware of it up to the present day. The fact is, that in this dilated throbbing carotid and its branches lies the source of the trouble. The vaso-motor nerve on one side is for the time paralysed, the vessels of the head dilate, more blood is sent to it; and thus the increased heat, throbbing, and pain which the patient has to suffer until the tone of the nerve is restored. The most important question to solve is the immediate cause of the function of the nerve being thus temporarily in abeyance. Since a stomach derangement usually accompanies the hemicrania, it is very frequently thought that the source of the trouble is always gastric, and that medicine of a particular kind will relieve. That this is partially true is no

doubt correct, but just as frequently the complaint arises from a direct influence on the nervous system. Besides, if arising from the stomach, the cause is not the same as that which operates injuriously in the mass of people from over-indulgence in eating and drinking, and which produces a more general headache in consequence, but the cause is a slighter one, and dependent upon a number of trivial circumstances which the sufferer himself could alone detail. It may be said no doubt with truth, that gastric derangement is a very common exciting cause in those who are subject to the complaint, but very frequently no cause for the attack is apparent, and certainly none attributable to the stomach. When the cause is evident, it is very often one which has acted directly on some portion of the nervous system, and to the non-susceptible would scarcely be credited with so powerful an operation. Thus all worry, excitement, or overwork will readily produce a headache; walking in the sun is a very sure method of inducing an attack; strong impressions on the olfactory nerve, as the smell of paint, and in some persons the odour of spring flowers; also impressions on the retina, as long use of the microscope, or a protracted visit to a picture gallery. An atmosphere overcharged with carbonic acid is one of the most fruitful sources of headache, as that of a crowded assembly-room, and what would affect myself at once and in the most intense degree would be the presence of unconsumed carbon from candles or lamps. Loud noises in the ear will also cause a headache; and, in fact, it would seem that a strong impression made upon any part of the nervous system is sufficient to induce an attack. Probably derangements of any organ might also bring it on, as of the stomach, which we constantly see, and in women the uterus, more especially at the catamenial periods. Some of the most violent attacks which we witness are in women at these periods. There are those who are doomed every month to an illness of a few days, with intense headache, prostration, and sickness; if there be much uterine pain, the case is styled one of dysmenorrhœa, and the cause attributed to the uterus, which may or may not be true. Those, both men and women, who are thus liable to these violent headaches are proscribed many of the pleasures of life, since irregularities of any kind are so apt to lead to their wonted complaint. Under the most favouring circumstances, however, it is my experience that they can never escape an occasional attack.

As such trivial causes are sufficient to induce an attack of this hemicrania or migraine, it might be supposed that some equally slight circumstance might be sufficient to counteract or cure it. I should think it probable that such is the case, although, after long searching for the remedy, I have not yet discovered it. Certainly the ordinary aperient doses which the medical man so commonly prescribes for a headache are useless; besides, the attack may have spontaneously subsided before there could be any expectation of a result from the medicine. The act of vomiting, however, does in some cases afford very speedy relief. This is not by getting rid of any crudities, for the stomach may be empty, and therefore the effect must have been through the nervous system. As regards stimulants, as a rule they cannot be prescribed; they often aggravate the complaint to an intense degree, although I have found that in some milder cases a little brandy-and-water or a glass of champagne has, after a short period, been apparently beneficial; sometimes a cigar. Of all remedies perhaps tea is the best, but I am not quite certain what amount of benefit is to be ascribed to the tea and what amount to the hot water. Tea, of course, is well known to have a direct and marked action on the nervous system, and thus it might appear absurd to raise a doubt as to its efficacy did I not know more than one person who obtains more relief for a headache by sipping very hot water than by any medicine which has ever been prescribed.

Those who have any knowledge of the perpetual and horrible throbbing in the brow or temple, also know that nature prompts relief by pressure on the aching part. The leaning the head against the hand or other object is in obedience to what instinct dictates. On lying down, the aching brow is always pressed against the pillow. By more direct and intentional pressure a

more marked relief is obtained. Thus, a pressure on the carotid in the neck will produce a suspension of the throbbing and the pain, but the effect is only for a time, as the blood apparently soon finds its way to the head by other channels. Although the use of pressure may at the present time have a show of reason, it has no doubt always been adopted at the dictate of nature.—*Medical Times and Gazette, Jan.* 2, 1869, *p.* 1.

20.—ON THE TREATMENT OF EPILEPSY.

By Dr. Samuel Wilks, Physician to Guy's Hospital.

As regards the treatment of epilepsy, it must be considered entirely empirical. The term rational can scarcely be introduced even in the minor questions of diet, air, &c. I have certainly known patients reduce their amount of food and drink, especially in the article of meat, and with a corresponding diminution in the number and severity of fits; but on the other hand, I know other cases where a generous diet has been equally necessitated. It is just one of those cases where particular drugs may be of service, and beyond their administration we can do little. If any old woman had the possession of a herb or a salt which could antagonise the disease, her knowledge would be worth more than that of the whole College of Physicians. I am happy to say that this does not apply to many other diseases where the knowledge you have acquired of their nature will serve you far more than all the medicines in the Pharmacopœia. The remedies, then, are empirical; those that have hitherto been most in vogue have been the metallic tonics. It is remarkable that such class of drugs seem to have more efficiency in morbid states of the nervous system than those which have a more direct physiological effect. In the whole range of nervous affections you will find this to be the case. In my own experience the only remedies of this kind which I have seen useful have been belladonna and nux vomica—drugs having different physiological actions. I have had cases where both remedies have been apparently beneficial. The metals have been used with a certain amount of success from time immemorial, such as arsenic, silver, iron, and zinc. Some years ago I used all these remedies largely amongst the out-patients, and should certainly give the preference to zinc; I know now more than one case of epilepsy where the patient is always better on the resumption of this remedy. If you suspect any local cause in the brain, you may adopt other measures; thus I have seen a case apparently cured by mercury. Those which were benefited by iodide of potassium had no doubt a syphilitic origin.

It was whilst I was examining the effects of the various remedies that I discovered the very superior value of the bromide of potassium. I was at that time trying this remedy against the iodide in bronchocele and some other disorders, and being in the habit of often using the iodide in epilepsy, I substituted the bromide for it. I was at first under the impression that it was acting as an absorbent, and was picking out for its operations those cases where the disease had a syphilitic or local origin; but when the cures came to be numerous, the explanation would not apply, and it was evident that a very valuable specific remedy had been obtained. Various writers had certainly mentioned the drug with a host of others, but only to again lay it on the shelf with them. I was not aware at that time that Sir C. Locock had recommended its use, for it does not appear that his observations had been specially brought before the profession, much less been confirmed by others. As far as I know it was when Sir C. Locock was President of the Royal Medical and Chirurgical Society, on the occasion of Dr. Sieveking reading a paper on epilepsy, that he made the following remarks, and which I quote from the Lancet of May, 1857:—"Some years since he had read in the British and Foreign Medical Review an account of some experiments performed by a German on himself with bromide of potassium. The experimenter had found that when he took ten grains of the preparation three times a day for fourteen days it produced temporary impotency, the virile powers returning after leav-

ing off the medicine. He (Dr. Locock) determined to try this remedy in cases of hysteria in young women unaccompanied by epilepsy. He had found it, in doses of from five to ten grains three times a day, of the greatest service. In a case of hysterical epilepsy which had occurred every month for nine years, and had resisted every kind of treatment, he had administered the bromide of potassium. He commenced this treatment about fourteen months since. For three months he gave ten grains of the potassium three times a day. He then reduced the amount, and the patient had no epilepsy since the commencement of the potassium. Out of fourteen or fifteen cases treated by this medicine only one half had failed." It was in the early part of 1860 that I commenced to use it; in the following year about a dozen cases were published in the Medical Times and Gazette, being the first series of cases systematically described (that I can find) in which the remedy had been found eminently successful. It was thus evident that the bromide was not simply supplanting the iodide in the cure of some special form of the complaint, but that the drug had some remarkable influence over the pure and simple form of epilepsy. This has now been confirmed by others, and even by those who had previously merely administered the bromide, as they had done many other remedies, without sufficient trial, and had discarded it. Of course, like every other remedy, its success has been overrated, and thus the disappointment which naturally accompanied the reaction of opinion, more especially when it was employed for almost every disease in the nosology. As regards drugs, then, I should say that zinc and the bromide are the most important; but you will have no lack of opportunity of trying the effects of remedies, for epileptics often insist on being physicked year after year when absolutely nothing is being done for them.

I ought to mention the occasional value of counter-irritants to the back of the neck, and of setons. I well remember two men who some years ago attended at the Hospital, and whilst the seton was open the fits were absent; when this dried up they returned. I have seen other cases of the kind since this time. I have already mentioned the case of a man whose life was saved by bleeding. I do not know that it is a remedy against the disease, but that it acts in the most beneficial manner if the paroxysm is long continued I have no doubt. In the case I referred to, the man had had a succession of fits for some hours, had swallowed nothing, and must shortly have died from congestion of the lungs, had not the lancet relieved his circulation and almost immediately restored him to consciousness. I think it very probable that in those cases in former times which were considered apoplectic, and in which recovery rapidly took place after bleeding, epilepsy was the real disease. I am convinced that I have seen several such, and therefore think they cannot be uncommon. A man, for example, is seized with a fit; you are called to him, and find him comatose, with stertor and apparent paralysis of one side; you consider it to be a case of apoplexy, and recommend bleeding; he soon afterwards recovers his consciousness, and after a few hours the weakness of the limb has passed, and the patient is comparatively well. Whatever the diagnosis, the remedy has succeeded, and thus, in a severe fit of epilepsy which becomes protracted, I have no hesitation at all in recommending you to open a vein. It might appear strange, after declaring that an epileptiform fit may be induced by loss of blood, immediately to recommend venesection as a remedy, but it does not follow that the theory and the treatment are antagonistic, for whatever may be the immediate cause of the seizure the result is a spasm of the chest, which, ending in congestion of the lungs, is best relieved by liberating the blood from the overcharged venous system.

I ought not to forget to mention the remarkable circumstance of our capability of arresting the attack by acting on the spot whence the aura proceeds. If the attacks were due directly to an irritation reflected from one spot, then the removal of this cause would stop the fit, as in the case of the child I mentioned, whose father assured me that the application of laudanum to a sore spot on the face would arrest or mitigate the paroxysm. But when the sensation on the surface is altogether subjective, a great difficulty in the explanation arises; unless we are content with supposing that as one portion

of the brain must be more especially involved in order for the sensation to be felt in one part of the body rather than another, so some external application to that part may cause a corresponding reflection backwards, and arrest the process that had already commenced.—*Med. Times and Gazette, Jan.* 23, 1869, *p.* 84.

21.—THE TREATMENT OF "EPILEPTIFORM" NEURALGIA IN ITS EARLIER STAGES.

By Dr. Francis E. Anstie, Senior Assistant-Physician to the Westminster Hospital.

["Epileptiform" neuralgia is that terrible form of facial neuralgia characterised less by the spasmodic onset of the pains than by the remarkable constitutional and family history which distinguishes the victims of the disease. Trousseau considered that nothing but a temporary alleviation of suffering could be expected.]

There is no doubt that Trousseau's description of spasmodic facial neuralgia, as a disease hopeless of cure, was, at the moment, nearly correct. He is evidently speaking of a malady quite different from the milder neuralgiæ which may occur at any time of life—a neuralgia which is rare, is confined to certain highly neurotic families, and which, among those families, only attacks a limited number of individuals who have passed the prime of life and entered upon the period of organic degeneration. The pain is of frightful severity, and is all the more difficult to bear because of the agonising suddenness with which it darts through the affected nerve, perhaps aroused by some trifling and necessary muscular movement, such as mastication. That very large doses of opium are required to produce any great impression on the disease, if the medicine be given by the stomach, is also perfectly true. These doses must be continued, and rapidly increased, with the unfailing effect of seriously disordering the functions of digestion and assimilation. And, after all, the best result attainable is, that for a few weeks or months there may be a notable diminution of the severity of the pain; but with the certainty that, sooner or later it will revive in all its intensity, and that then neither opium nor anything else will produce any perceptible impression upon it. The remainder of such a patient's life is rendered additionally miserable, in most cases, by a total derangement of digestion and consequent failure of nutrition.

Now I believe that a very much better result than this may be obtained if the malady be treated, from an early stage, according to the following plan:—1. Counter-irritation of a peculiar kind. 2. Nutritive tonics. 3. Subcutaneous injection of morphia, or of atropia, according to circumstances.

1. Counter-irritation, to be useful in epileptiform facial tic, should not be applied to the branches of the fifth, but to those of the occipital nerve, at the nape of the neck. A blister in the former situation is as often hurtful as useful: in the latter, it is sometimes strikingly effective in gaining a short respite. And this is of very great consequence in this awful disease; for the mere fact of such pain being allowed to continue is itself of the worst possible omen. 2. The assiduous use of cod-liver oil, or of some fatty substitute for it, should be insisted on from the first, and is of the highest consequence. 3. Subcutaneous injection places us in a totally different position towards the use of opium in spasmodic tic. There is no longer any excuse for the use of enormous doses of opium from the first. It will be sufficient to commence with the use of one-sixth of a grain of morphia twice daily, increasing this, if necessary, to one-fourth and one-half a grain: and, in rare cases, to one grain. If this produces, along with the other measures, a notable remission of the pain, it should be cautiously and steadily decreased, as circumstances may admit. In cases where morphia fails, atropia may be tried, in cases commencing at one-sixtieth of a grain. The injection of a less quantity than this would probably be useless in severe tic.

Hopeless as was the cure of the form of neuralgia which I have now described, under Trousseau's plan, or any other which might be directed to the

object of deeply narcotising the patient, the prospect is by no means so cheerless when the subcutaneous injection is employed, with the precautions above mentioned. Although I cannot say that I have ever seen a positive and complete cure of a facial neuralgia setting in under the conditions which have been described as peculiar to this disease, it is certain that the experience of those who have used the subcutaneous method extensively has proved that the attacks may be kept at bay, and their severity greatly mitigated when they occur; with this general result—that the setting in of a facial tic in the latter period of life, even in a patient whose family and constitutional history is of the worst augury, is no longer a fatal warning of life-long and scarce endurable misery. The economy in the necessary use of opium effected by the use of hypodermic rather than gastric administration is enormous; and this not merely for the purpose of producing a given effect by a single dose, but also (which is most important in regard to the preservation of digestion and nutrition) with regard to the rate of increase in the doses.

In the above remarks I have only referred to methods of treatment which are within the reach of every practitioner. It is necessary to state, however, that for those who are so circumstanced as to be able to provide themselves with proper apparatus for the generation of a constant galvanic current, the prospects of effecting good in even the most seemingly hopeless cases of spasmodic facial tic are very greatly increased. Not to dwell, now, on my own more limited experience, I maintain that it is impossible for any candid person to study carefully the treatise of Benedikt without coming to the conclusion that we have in the constant current a remedy capable of effecting much more, in these severe cases, than any treatment by drugs, or any other means. A low-tension current from a Daniell's battery (using from five to fifteen cells, according to circumstances) applied daily in *séances* of a few minutes, appears sometimes to entirely arrest facial neuralgia of the worst type, and commencing under the most unfavorable omens. Especially may we indulge hope, as it seems to me, in regard to the results which may be obtained from the galvanisation of the sympathetic, in cases which would otherwise afford no rational hopes of more than the most trifling amendment. But on this point I have not space to dwell at length, and any very condensed account of this mode of treatment would be likely to mislead. To those who possess the requisite preliminary knowledge of electricity and electro-physiology, and also the opportunities of providing themselves with the somewhat expensive and troublesome luxury of a really effective constant battery, I would urge the necessity of a careful study of the English treatise of Althaus, and the German treatises of Remak, Benedikt, and Meyer, upon the medical uses of electricity. They will find facts therein which will at once arrest their attention, and engage them seriously in a most important branch of the therapeutics of nerve-pain.—*Lancet, Jan.* 9, 1869, *p.* 42.

22.—ON THE USE OF BRUCINE IN STOMACHAL EPILEPSY.

By Dr. J. Spence Ramskill, Physician to the Hospital for Paralysis and Epilepsy; Physician to, and Lecturer on Medicine at, the London Hospital.

[Many cases of epilepsy have, as a warning of the coming fit, some disturbance referred to the stomach, such as nausea and flatulence. There may be no proper symptoms of dyspepsia in the intervals between the fits.]

Suspension of epileptic attacks is, for many reasons, always desirable. Yet suspension is not cure; and, for the most part, when you cease to give bromide of potassium, the attacks return. Can we prevent these? I think we can often do so by building up the patient, by using means to improve the nutrition of the tissues, of the nervous masses, and of the ganglionic nerves especially; for I hold that a convulsion is an impossibility in a perfectly healthy brain and nervous system; and I think these views should form the basis of all treatment. Is there any tonic remedy of value for this purpose? I think so; and I have found the best in brucine—beyond many

of recognised value. Mr. Tyrrell (of Malvern) has published some cases treated successfully by strychnine. I have used this drug extensively, and when the patient can remain under close observation, or if he be attended by intelligent friends, I should not hesitate in proper cases to recommend its use. But there are cases of idiosyncrasy, and small doses will sometimes evoke disagreeable toxic symptoms. I have not been annoyed in this respect with brucine, perhaps because it is a weaker alkaloid, and the patient gets more easily accustomed to its use. Its physiological effects, however, so closely resemble those of strychnia, that it may be taken for granted their therapeutical virtues are the same. I usually order it in a solution made of the same strength as the liquor strychniæ of the Pharmacopœia, and commence with a dose of ten minims, to be taken twice daily; every third day an addition should be made of five minims to the dose, until from a third to half a grain is reached. If any stiffness of the jaws or other toxic symptoms appear, the dose is to be diminished by five minims, and continued until any new objectionable symptom is manifest; then it is again lessened. You will not find any benefit from either brucine or strychnine, till a full dose is reached; often the reverse effect. As a rule, patients will take twice as much brucine as strychnine, without any necessity for diminishing the dose. After the continuous administration of brucine for a month, I think it well to suspend its use for some days, and then again resume it. I may remind you that Dr. Marshall Hall used strychnine in epilepsy, but he gave it in very small doses, and without success. Given in large doses, and with the precautions already mentioned, I have not met with any case suggesting cumulative action, or suddenly poisonous effect, from the administration of either alkaloid. You will find great satisfaction in giving bromide in large doses at bed-time, at the same time ordering brucine twice daily; thereby you ensure the sedative action of the bromide, and the tonic effect of brucine on the whole nervous system.—*Lancet, Jan.* 16, 1869, *p.* 76.

23.—ON THE TREATMENT OF CHOREA.

By Dr. Samuel Wilks, Physician to Guy's Hospital.

It might be thought by the inexperienced that those drugs which exert a physiological action over the nervous system would be those which would arrest the complaint known as chorea, but, as a matter of fact, this is not the case, so that I have almost given up looking for a remedy in the direction of this class of medicines. I do not despair, however, of finding some drug which might counteract that morbid condition of nervous system which is present in very bad cases, but in the absence of such remedy our ordinary curative means are of little avail, seeing that they can act only slowly and tend to produce a change long after the time at which the acute form of the disease would prove fatal. In these very severe and bad cases we can only hope to preserve the life of the patient sufficiently long for the most approved tonic remedies to act. For example, in such cases as I mentioned just now of children suffering from acute chorea induced by fright, a fatal termination may occur in a few days, and in these the direct sedatives are suggested. Morphia, as far as I have seen, is useless. I can call to mind two cases where large doses were given, but the effect was only transitory. The same with chloroform; the vapour produces but a temporary tranquillising effect, and our experience of it is not encouraging either in chorea or in the allied disorders, tetanus and hydrophobia. I have never seen strychnia of any use in the acute affection; and the same of belladonna and conia. In the less severe cases it is possible that one or two of these medicines may be useful, but I feel convinced that the class of medicines of which I speak—those which have a physiological action on the nervous system—are far less efficacious than the metallic tonics. It would seem that in order to produce a cure, a bracing up or restoration of the original nerve-power is necessary, and that the mere subdual of symptoms in no way tends to cure

the complaint. When I say this I speak with some little hesitation of the effects of belladonna and conium, both of which remedies I have seen apparently useful. I remember when at Paris some years ago hearing Trousseau give a lecture on this disease and warmly recommend belladonna. On another occasion he was declaring that there was no drug in the Pharmacopœia equal to strong coffee, and on a third occasion he was vaunting the new gymnasium at the Hospital for Sick Children as the best therapeutic agent he knew. I mention this to show you that there really is no specific treatment for the disease. I might say that we thought we saw some benefit in one case after the use of cannabis indica, but none whatever in four cases in which we tried the physostigma.

I believe I can tell you something very positive about the treatment of chorea, and I only wish I was enabled to make the same boast in reference to some other diseases. Many years ago, seeing that every medicine in the Pharmacopœia as well as several others out of it, were said to be equal to the cure of chorea, I determined to watch the disease untrammelled by medicine, and I found that in many cases a speedy recovery took place without the administration of any medicine whatever. The cases which did best were the severe ones, excepting always those which were of the most violent and acute description. The first case which I watched was a little girl who had severe chorea; she was too bad to be able to stand, and was obliged to have sideboards to her bed to prevent her wriggling out of it. This child began to improve in a day or two, and went out well in a month. This is only one example of several of the same kind. I take it that the patient, being subject to constant excitement or improper treatment at her own home, has her disease there perpetuated, whereas when brought to the hospital, being under the influence of strangers who endeavour to make her suppress the movements, and by the additional advantage of good living, she begins to recover. I should say that a weakened condition of the nervous centres being at the root of the malady, good nourishment and the tonic plan are necessary. After having learned the fact that the tendency of the disease is towards recovery as soon as all the circumstances which formerly surrounded the patient were removed, I soon afterwards learned that the cure is expedited by tonic medicines of the mineral kind, and this is the experience of the majority of the profession. I have put the treatment before you in this way to prevent you supposing that such remedies as iron or zinc act in any specific manner; they are useful, but operate as nervine tonics. I believe Dr. Elliotson many years ago acquired great fame by his success in the treatment of chorea, his remedy, as you know, being the red oxide of iron. We still give it, and it is one of the best of remedies; our children very willingly take half-drachm doses in treacle. Probably an equally favourite remedy here is the zinc—in fact, it is the medicine most commonly given, beginning with grain doses, and increasing to any amount, as a scruple three times daily. A favourite remedy of my late colleague Dr. Hughes was rhubarb steeped in port wine; the children were thus well kept up at the same time that the stomach and bowels were improved in condition.

In very chronic cases, and those where a part of the body only is affected, medicines are of little use. In some of these electricity has sometimes been curative; in some cases shower-baths have acted with the best success. One writer has advocated the use of liniments, as of chloroform, to the spine. Often nothing less than a thorough change of scene will suffice to break the habit. If this opportunity do not occur, gymnastic exercises are of use. They not only strengthen the muscles and nerves, but they break the bad habit; they convert in fact, an irregular movement into a regular one. If the arms are constantly moving, and are then employed in grasping a beam for swinging, a new and altered condition of the whole machinery accrues, and in time the habitual irregular actions are worn out. I am sorry that we have not a gymnasium here, and therefore all I am able to do is to order my patients a skipping rope. I believe the only method by which the chorea, which at one time prevailed in religious houses, was sometimes able to be cured was by

making the ladies dance to the notes of music.—*Medical Times and Gazette, Feb.* 6, 1869, *p.* 136.

24.—ON THE USE OF INDIAN HEMP IN CHOREA.

By Dr. Douglas, Vice-President of the Medico-Chirurgical Society of Edinburgh.

Dr. Russell Reynolds, who writes one of the most recent, and one of the best expositions of the value of this remedy, tells us, as the result of a manifestly practical and thoughtful experience, that "it is a soporific, anodyne, and antispasmodic; and that it relieves pain and spasm; that it does not leave behind it headache nor vertigo; nor does it impair the appetite, nor confine the bowels."

[The patient, a girl 13 years of age, was admitted into the Chalmers Hospital on the 15th of October last. A month previous to admission she had been taken with an attack of rheumatic fever. No symptoms of cardiac inflammation occurred. The choreal action had existed about a fortnight.]

During the day immediately succeeding her admission, a rapid change occurred in the degree of the choreal movements, and in the state of the heart's action. The latter became so disturbed, feeble, and excited, with feeble arterial pulse, as to cause serious anxiety for the safety of the patient, and at the same time the choreic agitation increased with such violent restlessness and rolling in bed that excoriation occurred over the sacrum and both nates, while contortion of the features and tossing of the extremities, especially when their movement was attempted, continued excessive. The articular effects of rheumatism decreased, temperature became more natural, the urine healthy, but the bowels became torpid. The arsenic was persevered with, and a few 30-grain doses of bromide of potassium were given. Each dose was followed by a short period of quiescence, but, on the 20th, the excitement of the heart's action became so alarming that 25-minim doses of tincture of Indian hemp were administered, followed by apparently marked, but only transient abatement of the spasmodic movement, which, as Dr. Hogg, the resident physician, reported, seemed to recur subsequently with increasing and distressing severity.

On the following day—that is, the sixth of her residence in the hospital—her condition seemed desperate, chiefly on account of the protracted and uncontrollable hurry of the heart's action. She was ordered to have *six minims* of the tinct. cannabis every hour, the arsenic and other remedies being intermitted. The bowels were now well regulated, the excoriations of the back and nates had increased so as to form superficial sloughs of considerable extent, the pulse was small and so rapid as not to be counted, and the heart's action was still feeble, rapid, and disturbed. She had four ounces of brandy per day. On the following day, having had twenty doses of the tincture, there was marked and increasing improvement. The violence of the tossing and rolling had diminished materially, though still it was necessary to have her secured in bed to prevent her falling or rolling over. From this time till the 15th day of her residence in the hospital, the tincture was administered from hour to hour, and she continued to make daily and progressive improvement. At that date (the 28th) she had been free of all the more violent spasmodic movements for two days; the heart's action was quiet, pulse about 80, appetite good, bowels regular. She still presented a degree of the peculiar grimace, with awkwardness in protruding the tongue, and in movement of the arms and hands. There was great mental lethargy, with languor and exhaustion, which made it impossible for her to be out of bed.

The tincture of hemp was now discontinued, and arsenical solution in four minim doses resumed.

The subsequent progress of the case, though tedious, and so far disappointing, may be told in a few sentences. On the 1st of November, and on several occasions during the rest of that month, there occurred a renewal of the choreal state, which had not indeed absolutely disappeared, though it

was often so trivial, and even absent as to encourage the hope of an early recovery. Arsenic was perseveringly employed, with a carefully-regulated diet and general management, but on each occasion, of which three were noted, when an exacerbation of the choreic condition arose, a marked abatement of the muscular action resulted from the administration of small and hourly repeated doses of tincture of hemp, relief sometimes arising so speedily as within six or eight hours. On one occasion the improvement was not detected for three or four days.

In the beginning of December, rheumatic symptoms recurred with slight febrile action and articular pains and renewal of choreic agitation. At the same time, marked excitement of the heart's action was renewed, and now, for the first time, a faint soft diastolic murmur, indicative of aortic regurgitation, was with difficulty perceived. A weak solution of acetate and nitrate of potash was administered, and grain doses of opium four or five times in twenty-four hours. Pain and fever abated, but not the spasmodic movement, and on the third day afterwards six-minim doses of tincture of hemp were given every two hours, followed by an immediate decrease of the chorea, which at once declined to the slightest degree in two or three days.

The patient now presented more marked indications of returning health. The state of mental lethargy into which she had early lapsed was now passing off; her appetite was revived, and on the 20th December she was able to be out of bed and to walk with assistance. Small doses of the iodide of potassium with the infusion of quassia were given, and improvement went on uninterruptedly; she did not, however, cast off the choreic jerk and awkwardness till the second week of January, 1869. She has since had a very comfortable convalescence, but the diastolic murmur noted above continues strongly developed.

The impression which the case leaves on my mind is, that cannabis has a peculiar value and power in controlling the irregular movements of chorea, which ever and again are terribly distressing, and possibly even dangerous, to the patient; and it would be of no small moment to determine the extent and limit of its influence, and to ascertain whether or not choreic action, even in slighter cases, might not be moderated by this remedy.

As to the mode of administering the remedy, small and frequent doses proved both safe and effective, and great advantage appeared to arise from increasing the frequency of the dose rather than its amount. Believing, as I do, that cannabis indica is a remedial agent of value in many and various maladies, I am prepared to recommend this mode of seeking its effects by frequent rather than by larger doses at longer intervals. Such a mode of prescribing it has not been usual; but I find, quoted from an American source, the account of a case of hiccup treated in this way by eight-drop doses of a fluid extract, administered hour by hour, in which recovery from an attack that had defied treatment for five days took place in a few hours.—*Edinburgh Medical Journal, March* 1869, *p.* 777.

25.—THE CALABAR BEAN IN ACUTE TRAUMATIC TETANUS AND STRYCHNIA POISONING.

By William Alexander, Esq., Dundonald, Ayrshire.

[The first of the two cases mentioned in the following article was a boy eleven years of age, in whom symptoms of tetanus appeared eighteen days after a wound of the hand by a chaff-cutting machine. Next day the report is:]

August 6th, noon. Opens mouth better, but with an effort. Tongue very brown. Marked opisthotonos, with frequent spasms, involving the entire body. Spasms excited on touching him or approaching his bedside. Cannot move himself in bed. Powders have operated once. Has had four doses Indian hemp. Pulse 130. To begin now with the following:—

℞. Ext. physostigmat. venenos. grs. viij.; sp. vin. rect. ʒss.; syrup. simp. ʒij.; aq. fontan. ʒiss. M. solve.

A teaspoonful to be taken in water every hour. To have beef tea and milk for diet.

8 p.m. Much in the same state. No more action from bowels. Head very much retracted. Back extremely bent. Abdomen flat and tense. Frequent spasms. Pulse 130. Repeat the purgative powders.

7th, 8 a.m. Slept sound during the night, vomited occasionally. The spasms and opisthotonos continue, but have not increased in severity. Has had sixteen doses of the extract since noon yesterday, the last about an hour and a half ago. Pupils slightly contracted. Opens mouth better, and puts out tongue, which is still very brown. Pulse 110, soft. No action from bowels.

8 p.m. Had his extract every hour and a half up to one p.m., since which he has only had two doses. The contracted pupils, and jerking pulse at mid-day caused me to lengthen the interval between the doses. Opisthotonos with spasms continue. Pulse 90, soft. Breathing, calm, easy. No action from bowels since yesterday morning at eight o'clock. Had senna infusion to-day at four p.m., of which he vomited a part. Gave an enema of soap and water, which acted freely.

8th, 9 a.m. The spasms with opisthotonos were very severe after I left him last night. His father, who watched him most faithfully, had instructions to give the extract every hour, if necessary, and having done so, the boy was much relieved by midnight, and now continues so, though the spasms and opisthotonos are still present. Since one o'clock this morning he has slept for nearly two hours. Opens mouth much better, and puts out tongue well. Tongue very brown. Abdominal muscles relaxed. Pulse 96, soft and rather weak. To have sherry to-day, as he felt weak when his bowels were moved twice during the night. Stools very dark and fœtid. Finished his first bottle of the extract in solution about an hour ago, having thus taken eight grains of the extract in forty-five hours.

[During the rest of this day and the next the extract was given every hour, except when asleep. On the evening of the ninth an attempt made to give his extract at longer intervals was followed by a recurrence of the spasms and opisthotonos. By the 11th of August he seemed improving, but losing strength somewhat. He continued varying from day to day, the Calabar bean being given as before. Recovery ensued.]

The boy was most carefully watched by the parents, who had a discretionary power given them to lengthen the interval between the doses when the symptoms warranted them to do so; but in the various attempts they made it was invariably found necessary to resume its use every hour, or every hour and a half. In these circumstances, although the case might be looked upon as cured on the 19th, still I thought it advisable to keep up the action of the Calabar bean for some time longer, lest the spasms should return, and the treatment be prolonged. Although the spasms and opisthotonos were in this case severe enough, yet they never reached that degree of suffering which I have witnessed in former cases, all of which terminated fatally. Nevertheless, I look upon it as a case of acute traumatic tetanus, taken in the incipient stage of the disease, and so thoroughly controlled by the action of the bean, that the more violent symptoms could not manifest themselves. I have every confidence in the action of the bean for relieving the spasms, even though it may not be always successful in curing a case.

In August of this year another case of traumatic tetanus came under my care, and was treated in the same way with a like favourable result.

G. B., aged 12 years, August 6th, had slight trismus, with inability to project his tongue. Complains of pain in each side of throat and over dorsal spine, not aggravated by pressure or percussion, and also of uneasiness at junction of upper with middle third of sternum on left side. On walking, his gait is unsteady, and, on turning round, he is observed to stagger, a thrill, as it were, passing through the body at the same time. Face has nothing of the tetanic appearance, and yet the expression is not natural; he looks as if he

were about to cry, and does so when questions are put to him. Pulse 66, tongue slightly coated. Has a very small cicatrized incised wound, a quarter of an inch in length, in point of right thumb, and a small punctured wound in sole of left foot, neither of which have been of any depth. No other injury is apparent or admitted, except that, in play with other boys, he was rolled over by one of them, and has felt the pain in left side of sternum ever since. About three weeks ago, during the very hot weather, he suddenly became giddy, sick, and faintish, and was supposed by his parents to have a threatening of sunstroke, but had no treatment. Ordered him an active aperient, and to await the development of other symptoms.

August 7th. More evidence of tetanus setting in. Slight spasms, involving limbs, with more rigidity of jaw. Medicine has acted well. Stools brown, pulse 66. Repeat the purgative powder. Ordered the following:—

R. Ext. physostigmat. venenos. grs. viij.; sp. vin. rect., ʒ ss.; tinct. valerian., ʒi.; syrup. simp., ʒi; aquæ, ʒiss. M. Solve.

A teaspoonful every two hours.

8th, 9 a.m. Having vomited the first spoonful of the extract, and the symptoms being slight, only half the quantity was given, and at long intervals during the night; but this morning the spasms are more frequent and severe. Belly tense and hard. Pulse 78, soft. Ordered the teaspoonful every hour, with discretionary power to allow a longer interval between the doses if necessary.

9th, 10 a.m. Had a teaspoonful of the extract every hour yesterday till four p.m., when he slept for five hours, and on awaking with a spasm, got it every hour during night. Slept none during night. Complains occasionally of the pain in cervical, but more commonly in dorsal region. Has pain now in epigastrium. Trismus continues, and spasms come on every hour causing him to cry out with the pain. Abdomen very flat and tense. Bowels opened twice; stools very dark and offensive. Pulse 78, soft. Breathing easy. Vomited several times during night, as often after his food as his medicine. Cannot now lie in bed, but sits in semi-erect position, propped up with pillows, head bent forward—emprosthotonos. Continue the extract every hour, and give purgative powder at night.

11th, 10 a.m. Has gone on in the same way, the spasms with pain in back and epigastrium, recurring every hour, till this morning at one o'clock, when his attendant became afraid to give the extract so frequently, and the spasms have since increased in severity and number, the cries of the boy during the spasms being painful to listen to. Ordered ice bags to spine, and to have the extract every hour, with the purgative at night.

[We omit the reports of the case until Sept. 8th.]

8th, noon. Been free from spasms since the 3rd instant, and had none of the extract since the morning of the 6th till last night at twelve o'clock, and again this morning at 8.25, having on these two occasions complained of pain in dorsal region, with slight spasms, probably the result of over-exertion or fatigue, as he has been out of bed daily since the 3rd, and on the 6th sat up all day and exerted himself more than he had done. Is at present free from pain. Slight bending forward of dorsal vertebræ is visible when he sits or stands. Walks with a stiffness at hip and ankle-joint, but able to go out of doors to-day, leaning on an arm. Tongue clean. Pulse 72. Bowels regular; stool natural. Belly fuller.

13th. Is now quite well.—*Glasgow Medical Journal, Nov.* 1868, *p.* 41.

26.—CASE OF TETANUS, WITH REMARKS.

By Dr. E. Watson, Professor of Physiology, Anderson's University, and Surgeon to the Royal Infirmary, Glasgow.

On the 26th of June, 1868, I was asked by Dr. Fergus to see a patient of his who was affected with tetanus. I found that the disease had been coming on for some days, and that its cause was very obscure. The patient was a

young man, twenty years of age, who had for some time been annoyed with a papular eruption on the skin of the arm, for which he had been treated by a chemist in town, without applying to his medical attendant. I therefore inquired of this chemist what drugs had been used by him, but found that they were sufficiently safe and simple. Some of the papules were suppurating when I looked at them. The patient had also received a slight cut with a piece of copper on the same arm, but the wound was quite healed.

When I visited the patient his back and extremities were very rigid, and he was taking frequent fits of opisthotonos, but his face was less affected than usual, and he could swallow well. I therefore commenced the treatment with good hope of the result.

At first he took the tincture of the bean made by percolation, but as soon as possible it was changed for the following tincture, in using which one can be more precise as to the doses administered:—

℞. Ext. physostigmatis venenosi, grs. viij.; aquæ bullientis, ʒss.; sp. vini rectificati, ʒiss. M.

The extract is dissolved in the water at a boiling temperature, and the spirit is gradually added. The fluid is then filtered, when a clear sherry-coloured tincture is obtained. I have kept this tincture for three months without any turbidity or other change taking place in it, and I believe that it is sufficiently stable for all practical purposes. Every ten minims contain one-twelfth part of a grain of the extract, which is a good dose to begin with in an adult.

Such a dose was given every hour at first, with the effect of greatly relaxing the stiffened muscles of the back and extremities. His bowels were likewise freely moved on the 26th, by a dose of castor oil, with a drop of croton oil mixed with it. He had short sleeps during the night, but next morning the spasms could still be excited, though neither so readily nor so severely as formerly.

During the first part of the 27th he had his doses of the tincture every half hour, and felt so much the better of each dose that he constantly asked for them himself, and would have taken them even oftener. By mid-day his body was more relaxed than ever, so that he could move himself in bed, and raise his head from the pillow. I therefore left him in the care of Dr. Fergus, with particular instructions how to proceed. These were carefully carried out by him, and the case went on most favourably. The patient's hopes were completely restored, and he spoke of soon being at business again. The administration of the bean was continued every two hours during the night, and in the morning (28th) Dr. Fergus found that it had considerably affected his patient with its depressing action. In fact, the patient fell into a syncope when Dr. Fergus was present, but by admitting fresh air and rubbing the chest he recovered and seemed much improved. Unfortunately, however, after Dr. Fergus had left, he again fell into a similar state, and, as there was some loose mucus in the throat his friends turned him round to allow it to fall out; on their doing this, he was seized with a violent and universal paroxysm, in which he died about ten a.m.

On returning to Glasgow, which I did on the following morning, I was greatly mortified at learning the result of this case. It is the first and only fatal case which has occurred to myself in which the bean has been fairly tried. I did regret that the patient had been perhaps roughly, because hurriedly, turned round upon his face, for no doubt that was the exciting cause of the fatal convulsion. Had the milder, and sufficiently effective means, adopted by Dr. Fergus, been again employed, I think the issue might have been different. But whether this be so or not, I think we may learn from this case the following lessons:—

1. That in the most violent cases of tetanus the bean may be so administered as to diminish the force and duration of the convulsions.

2. That the bean does not rapidly counteract, far less change the morbid lesion in which the proximate cause of tetanus consists. In the preceding case the spasms were greatly mitigated, and yet the disease still existed, in

a latent state no doubt, but yet capable of being roused into great and even fatal activity.

3. That it is, therefore, of great importance to commence the use of the bean early in all cases of tetanus, so as to give it time to act before the disease has become matured. In the preceding case the disease had reached its greatest violence before the medicine was begun at all.

4. That in the state of depression, which is one of the physiological effects of the bean, the patient can very ill bear the renewal of the convulsions. The case is an example of this, and I have often witnessed the same thing in my experiments on the lower animals with strychnia and Calabar bean. The gentlest means for restoring the feeble respiration of the patient when so affected, should alone be employed, and the mouth or throat should be cleared by means of the finger, or by any suitable substitute for it that comes first to hand.

The cases of tetanus treated by the Calabar bean, as I have recommended it, now amount to the following numbers:

	No.	Recovered.	Died.
My Infirmary cases	4	3	1
Case treated by Dr. Fergus and myself . .	1	0	1
Dr. Alexander's cases	2	2	0
Dr. Campbell's case	1	1	0
Total,	8	6	2

These were all acute traumatic cases of tetanus, some of them very severe, and all of them warranting the most unfavourable prognosis. Indeed I believe that a similar good result could not be shown in such cases by any other kind of treatment. It ought to be remarked, likewise, that one of my fatal cases (Lancet, 1868) was really not treated at all, as the man was dying when I saw him, and he only doubtfully swallowed one dose of the remedy.—*Glasgow Med. Journal, Nov.* 1868, *p.* 51.

27.—CASE OF STRYCHNIA POISONING.

By Dr. John W. Keyworth, Birmingham.

On the 23rd of July, 1867, at 7 a.m., I was sent for to a female patient of slight suicidal tendency, who had taken at 11 o'clock the night before, a packet of Battle's Vermin Killer (containing it is stated, 3 grs. of strychnia). The body and limbs were perfectly rigid with spasms, which, when occasionally relaxed, was excited by merely blowing in her face, or by the shaking of the floor in walking. She had been in this condition since 2 a.m., gradually becoming worse. She was speechless, but conscious, and her pulse very rapid and feeble. Her face was livid. The jaws were constantly fixed. Having recently read your paper, and seeing also that the case was almost hopeless, I sent up to the Eye Infirmary for some of the wafers. Failing there, I obtained from Messrs. Southall of this town, pharmaceutists of the first order, some tincture of Calabar bean. They could not give me any information as to the dose. I gave 30 drops every half hour till two drachms had been taken, pouring it into the mouth where a tooth was absent. The effort of swallowing produced violent spasm. After each dose the attack grew less frequent and strong, and I then gave two half drachms at intervals of an hour, then 15 drops every two hours. Altogether half an ounce was taken. The pulse then became extremely weak, the spasms almost ceased, but the woman could scarcely speak or swallow. At the end of some hours she remained very feeble, quiet, but sleepless, and her legs and arms "felt like lead," and were utterly immovable. This gradually subsided, but she could not stand or walk for four or five days, and was three weeks before she fully recovered. The poison was taken in gin, and appeared, from the inspection of the cup, to have been wholly taken. An hour and a half afterwards she appeared, her friends said, "to be in a fit," and

shortly afterwards became "convulsed." The effect of the Calabar bean in relaxing the spasms was apparent in about twenty minutes after taking the first dose, and became more apparent and decided after each repetition.

This is the only case in which I have as yet had an oppertunity of trying the antidote, and of course it proves little: but I shall certainly be disposed to repeat it in any analogous case. The instance was favourable, inasmuch as from the time the poison had been taken, and the condition of the patient, emetics and the stomach-pump were out of the question. And as strychnia appears to destroy life chiefly, if not entirely, by its action on the muscles, there would seem every reason why with it, as well as tetanus, this antidote should be effectual.—*Glasgow Medical Journal, Nov.* 1868, *p.* 54.

28.—CONTRIBUTIONS TO THE ELECTRICAL TREATMENT OF PROGRESSIVE MUSCULAR ATROPHY.

By Dr. C. Hilton Fagge, Assistant Physician and Medical Registrar to Guy's Hospital.

["Progressive muscular atrophy" is also known as "Wasting palsy" and "Cruveilhier's paralysis." It always occurs in the muscles of the upper extremity, but is quite distinct from scrivener's palsy. Within the last few years Duchenne has described a form of paralysis resembling true Cruveilhier's paralysis, but really a different affection. The characteristic points in Duchenne's paralysis, is that the disease is hereditary and attacks in succession all the males of the family. During the last two years ten cases of Cruveilhier's paralysis have been admitted into Guy's Hospital.]

In giving brief notes of these cases, I will first mention those which have been treated by the *continuous current* alone, after the method introduced by Remak. This consists in the employment of a "constant" battery, having 100 cells, of which a variable number are used, according to circumstances. One pole, the positive, is applied to the back of the head or neck, generally to the mastoid process; the other, or negative pole, is placed over the spine, not higher than the fifth cervical vertebra. When this is done, contractions are sometimes observed in the fingers, or in other paralysed parts,—which contractions Remak has termed "diplegic." The current is allowed to pass for a quarter of an hour at a time, and its application is repeated daily. This method appears to be entirely empirical, having no theoretical foundation whatever; but it must be admitted that in some cases success justifies its use.

CASES TREATED BY THE CONTINUOUS CURRENT.

Case 1.—(Reported by my clinical clerk, Mr. Bransford Edwards.)—G. P. H., age 27, admitted into clinical ward, under my care, June 12th, 1867. He is a harness maker. About eight weeks ago he began to feel weakness in his arms, and became unable to grasp firmly with his hands. He also had *tingling* sensations in his arms. The muscles of the fore-arms, except the supinator longus, were considerably atrophied; and the interossei, and other muscles of the hand, were also much wasted. The movements of the hands were very imperfect; for instance, he had great difficulty in unbuttoning his shirt. Tremor was not present in any marked degree; I think I observed it slightly in one of the muscles of the left fore-arm. On testing the muscles with the continuous current, it was found that thirty-five to forty cells were required to produce contractions in the extensors of the fore-arm; whereas the biceps reacted to twenty cells. The medicine which was prescribed for him, besides an occasional purgative, was a mixture containing three grains of iodide of potassium, which he took three times a day for seven days, when it was discontinued, in order that the value of the electrical treatment might be more surely tested. This treatment consisted in the application of the continuous current to the spine (according to Remak's method) every day, for fifteen minutes at a time. It produced a strong galvanic taste, and a tingling sen-

sation in the right arm (the electrode was applied beneath the *right* auricle). The fore-arms were wrapped in cotton wool, and placed upon splints. After seven days of the treatment the splints were removed, and it was then found that there was decidedly more power in the grasp. At the end of sixteen days he could dress himself with ease, and could write tolerably well. He could not bear so strong a current as at first; twenty-five cells now produced distinct contractions in the arms and legs simultaneously. The muscles were fast regaining their firmness and tone. He continued to improve. On August 22, it is noted that he could write several letters in a day. He went out nearly well, on September 21, 1867. I have since heard (Oct. 1868) that he has remained free from any further symptoms of the disease. Besides the affection of the arms, this man had likewise weakness of the lower limbs; from this he recovered at the same time.

Case 2.—(Reported by Mr. Colson.)—J. H., aged 27. The disease had begun two years before, with numbness and coldness in the thumb of the right hand, gradually extending to the other fingers, and to the fore-arm. Subsequently the left hand became affected, but to a less degree. He was in the army, and therefore was not called on to use his hands unduly. On his admission the affected muscles were found to be greatly wasted, the thenar and hypothenar eminences being quite hollowed out. He had more loss of power on getting out of bed in the morning than at any other time. He was ordered to take julep. iodinii comp., and to use the continuous current; no marked improvement, however, took place, and he went out on Dec. 31, 1867. He continued to attend as an out-patient, but without result, and when I last saw him he was still *in statu quo.*

Case 3.—(Reported by Mr. H. K. King.)—W. R., age 49, a saddler, admitted into the clinical ward, under Dr. Moxon's care, July 2, 1867. For about twelve months he had noticed his thumb to be getting weak; and for six months he had found that he had difficulty in holding a pen. There was much wasting of the flexors of the fore-arms, and of the thumb muscles. He could not grasp with the thumb, nor could he extend the last two joints of the fingers. The case, in fact, was a well-marked example of Cruveilhier's paralysis. Treatment with the continuous current was commenced on July 8. It led to no very decided improvement. He went out on Sept. 9th.

CASES TREATED BY INDUCED CURRENTS.

Case 6.—(From notes by Mr. Barry.)—G. L——, age 53, admitted under my care, Feb. 6, 1867, with very advanced progressive muscular atrophy of the upper limbs, and a similar affection commencing in the thighs, as was shown by muscular tremors and shooting pains. The disease had begun four months before. When this patient was in the hospital, the continuous current apparatus was not available, and therefore the affected parts were Faradized as regularly as possible. The biceps was the only muscle of the upper limb in which distinct contractions were produced by the induced current. He went out on June 4, unrelieved. After returning home he improved considerably, so far as the lower limbs were concerned. I went to see him at Orpington in the course of the summer; and he walked with me for a mile, or a mile and a half. His arms were still *in statu quo.* I have since heard that he is dead.

This man was a plumber, and had a well-marked blue line on the gums. I at first regarded his case as one of lead paralysis, but I think there is little doubt that this view was incorrect. He had had very little to do with lead for two years before; he had never had colic; there was not the usual dropping of the wrists, flexion and extension being impaired more equally than is the case in lead paralysis; he had taken iodide of potassium as an out-patient without benefit; and the intractability of the symptoms is quite unlike what one sees in lead paralysis. It is to be regretted that we could not test the action of continuous currents on the affected limbs; their effects are supposed to afford a critical distinction between the two diseases.

Case 7.—(From notes by Mr. Chapman.)—G. M——, age 47, admitted under my care March 13, 1867. He was affected with well-marked pro-

gressive muscular atrophy of seven months' duration. The muscles of the shoulders were much wasted, and affected with marked twitchings. He was ordered to take mist. quiniæ c. tint. nucis vomicæ ℥ iij, *ter die*, and to be galvanized every other day. He improved slightly, being able to raise his arms better. But there was no very decided benefit. He went out on June 4.

Case 8.—A. C——, age 24, admitted under Dr. Wilks' care into the Clinical Ward, July 4, 1866. She said that she had never been very strong, and that since the death of her mother, five years before, she had had bad health. Her existing symptoms, however, dated from two years back, when she "entirely lost the use of her hands, and ultimately of her legs also." The fingers and toes became firmly flexed. On her admission they could not be extended, even by force, and they presented a well-marked "griffin's-claw" appearance. The muscles of the extremities were wasted to an extraordinary degree, the interossei of the hands having almost disappeared, so that the finger and the thumb seemed to meet between the metacarpal bones. She had, in fact, the appearance of a mere skeleton covered by skin. She lay on her back in an utterly prostrate condition, and could only raise her hand a few inches from her bed. There was a distinct "blue line" on the gums. The water which she had been drinking was analysed by Dr. Stevenson, who found it to contain half a grain of lead in the gallon. She was, in the first instance, ordered to take iodide of potassium, and after three weeks Faradisation was commenced. She began to improve gradually but surely; and on October 2, when she was transferred into Lydia Ward, she could extend her fingers, and feed herself tolerably well with a knife and fork. The nutrition of the muscles had gradually improved. On October 20, she tried to walk with a chair, but could manage only a few steps at a time. On November 8, she walked across the ward. On December 3, she menstruated for the first time during her illness. On January 7, 1867, she went out well.

This patient has since visited Guy's Hospital, and was then well nourished, healthy-looking, and able to walk as well as ever. Dr. Wilks speaks of the case as perhaps the most remarkable cure (or recovery) that has ever come under his observation.—*Practitioner*, *Dec.* 1868, *p.* 345.

29.—CASES ILLUSTRATIVE OF THE TREATMENT OF PARALYSIS BY THE APPLICATION OF COLD OR HEAT ALONG THE SPINE.

By Dr. JOHN CHAPMAN, Physician to the Farringdon General Dispensary.

Case of Apoplexy with Hemiplegia.—On December 3, 1864, I was called to see a gentleman, aged 55, whom I found in a state of profound stupor; he could not be roused, the right arm and leg were paralysed, the leg less completely so than the arm. When the hand was pinched severely there was no evidence of sensibility; the left hand was of a markedly dusky hue, the nails being slightly purple; the temperature of the left side was considerably lower than that of the right, and the pulse which was 82, was much feebler at the left than at the right wrist; the head was hot; both eyes were closed, the left one being protruded abnormally and slightly lachrymose; the face was drawn to the left side.

I applied an 8 inch spinal water-bag, containing water at 120° Fahrenheit, to the cervical and upper dorsal region of the spine. This bag was ordered to be refilled at frequent intervals, so that the application of heat might be continuous during the day or whenever the head should be found hotter than natural. A spinal ice-bag was also ordered to be applied at once during three-quarters of an hour to the lower third of the spine, and to be repeated the same afternoon. In less than twenty minutes after the hot-water bag was first applied, the head had become much cooler than before, and within twelve hours some degree of returning consciousness was evinced. The

treatment was modified according to symptoms as the case progressed. The patient steadily improved day by day. At the end of a week he was talking with facility; on the 23rd of the next month he walked between one and two miles two days in succession, and in February he called upon me, and reported himself quite well, and impressed me as being so both mentally and physically.

December 3rd, 1865, exactly a year after the date of the above mentioned attack, I was called to this patient again. On the previous day he became suddenly giddy and incapable of standing. Shortly afterwards he vomited and was relieved, but his speech, which was previously perfect, had become much impaired, and immediately before I was summoned he suddenly lost the power of speech, his eyes becoming, as his wife said, "fixed and glassy." Ice was applied to the spine and benefited him considerably. I found him much better again, and his speech, though greatly impaired, was intelligible. I ordered ice to the lumbar region 45 minutes at eight p.m., a saline mixture and light food.

After passing a good night, vomiting came on at 5.30 a.m.; consciousness and the mental faculties were greatly impaired, and the power of speech was so far lost that he was quite unable to make himself understood. Ice was applied at nine a.m., and at ten a.m. I saw him, when he had somewhat improved; he was conscious, and he had recovered his power of speech to a slight extent; but his mind was dull and confused. The face and tongue were drawn to the left side, and both arms were slightly paralysed. Pulse 76, full and fairly strong in the right wrist, extremely slight and feeble in the left. I requested ice to be applied during thirty minutes every two hours, to the lumbar region; and the water bag at 115° Fahr. to the cervicodorsal region during ten minutes, also every two hours, but alternately with the ice. The saline mixture was continued; and the patient was nourished with beef-tea. In the course of two days he was very greatly improved in all respects; the heat and cold were then applied at more distant intervals, and on the following day (December 7), I found the head clear, the speech fairly recovered, and the pulse in the left wrist much increased in strength and volume. The use of heat was then discontinued; and I requested the ice-bag to be applied along the lower two-thirds of the spine half-an-hour, and the saline mixture to be given three times a day. By the 21st of the month the patient had quite regained his former health; his mind was clear, his speech distinct and normal; his face symmetrical, and his pulse in the left wrist as strong as that in the right. The medicine was discontinued, and the ice after being applied once daily until the 26th, was left off at the request of the patient, who, at that date, took a long walk alone.

Case of Apoplexy, with Hemiplegia.—On March 14th, 1865, I was called to a patient at Brighton, a stout woman, aged 60, who, in the afternoon of the previous day, being excessively flushed, with a dull heavy expression, staggered towards her bed and fell down senseless. The physician, who was immediately called in, said she was dying. He staid with her until three o'clock of the following morning, and, on leaving, sent a woman to "lay her out." As stated by a spectator, "she gasped, seemed to breathe only at intervals, was blue round the mouth, clayey-looking; the whole features seemed to sink; her head, shoulders, arms, and legs were quite cold, and her face was covered with clammy sweat." She remained in this state during forty-eight hours. At the end of this time I visited her. The head and face were strikingly cold and death-like; the eyes exuded a thick gluey fluid; the left pupil was dilated and immoveable in the presence of light, the right pupil was contracted; the right side was more dusky, and somewhat colder even than the left; the face was drawn to the left side. On tickling the soles of the feet, there was a slight movement of the left foot; none of the right.

In the treatment of this case, my efforts in the first instance were directed to produce alternate contraction and relaxation of the cerebral blood-vessels, in order to effect movement of the stagnate blood within the head. Accordingly, I applied heat on each side of the upper third of the spine for a few minutes, then removed the bag, while still hot, and shortly afterwards re-ap-

plied it. Within fifteen minutes of my first application to the spinal region, an area of about two and a-half inches in diameter in the middle of the forehead became quite warm. Before twelve hours had elapsed, the whole head and face became warm; and within twenty-four hours, or by the evening of the 16th of March, her whole body was warm. On this day she saw a cup of beef-tea in the hands of an attendant, and opened her mouth as if asking for it. The same evening she was believed to have recognised her daughter. From that date she steadily progressed in intelligence, so that by the end of the month she appeared to understand all that was said to her, could appreciate a joke, and could answer questions by monosyllables. She began to gain some power on the paralysed side, and, as the weeks passed, her improvement in intelligence and power of expression gave promise of her ultimate recovery, though of course, with the probability that she would continue more or less hemiplegic. She lived about three months; but, unhappily, owing in part to the neglect of her nurse, sloughing over the sacrum came on unperceived, pyæmia followed, and proved fatal.

In both cases the great therapeutical efficacy of the spinal hot-water bag was signally manifested. One of the sons of the first of the two patients, a very intelligent young gentleman, who sat up at night with his father, expressed himself much astonished by the power of the water-bag in reducing the heat of the head, and volunteered the statement that when his father's breathing was stertorous, the application of the bag speedily caused it to become quite tranquil. I may add here that, in the case of a patient under my care, who is liable to become unconscious by reason of a great and sudden afflux of blood to the brain, the application of this bag at a temperature between 115° and 120° Fahrenheit, will invariably cause the hot head to become cool, and simultaneously consciousness returns.

It will be observed that I applied heat to the upper portion of the spine, and cold below, at the same time, in the first of the two cases just reported; and I may add that, in the second case, I often had occasion to do the same. The simultaneous application of heat above and cold below, or the reverse, so far from resulting in the neutralization of the effects of the one by the other, actually augments greatly the force of each. For example, while heat to the upper third of the spine effects the contraction of the cerebral arteries, and so lessens the amount of blood in the brain, cold along the lower third of the spine, by causing the dilatation of the arteries of the pelvis and lower extremities, increases the amount of blood in those parts, and, therefore, to a proportionate extent, derives it from the chest, upper extremities, and brain. Hence, if I wish to exercise only to a moderate extent a sedative influence on the brain, I apply the lumbar ice-bag; but if I wish to act more vigorously, I apply the double-column hot-water bag to the upper third of the spine; if more vigorously still I use the two simultaneously. The two cases just described afford most satisfactory illustrations of the unprecedentedly great remedial power in cases of apoplexy which this method of treatment affords. Of course, the sooner after the "stroke" treatment is adopted, the greater will be its efficacy. My experience, however, enables me to say, that in cases of paralysis of several years' standing, great good may often be done by means of these spinal applications. In the appendix to my pamphlet on "The Functional Diseases of Women," I published a case, the chief features of which are as follows:—

Case of Chronic Hemiplegia, with rigidity of the left upper extremity, coldness of the paralysed side, headache, dorsal hyperæsthesia, and constipation.—A boy, aged 13, afflicted with hemiplegia (left side), was brought to me June 1, 1863. At this date I made the following notes of his condition:—Has a florid complexion, looks healthy, and is very intelligent. Complains chiefly of being unable to use his left arm. He cannot raise it above his head, as he can the right one—being unable to lift the hand higher than the face. The fore-arm cannot be completely extended, and is firmly fixed in the prone position. The wrist and hand are not only powerfully drawn to the ulnar side, but so firmly flexed on the fore-arm as to resist whatever extending force the patient can apply with his right hand. If, by additional external

force they be brought into a straight line with the fore-arm, immediately they are released from it they return to their abnormal position. The metacarpal bone of the thumb is strongly adducted and held (immovable by the patient's will) in the palm of the hand. The four fingers are permanently bent inwards, the middle one being flexed over the end of the thumb and deeply indented by the thumb-nail. The third phalanx of the index finger bends backwards on the application of the slightest pressure, and is incapable of offering any resistance—that fasciculus of the flexor profundus digitorum, which converges into the tendon of this finger, being paralysed. The whole upper extremity of the left side is considerably shorter and smaller than that of the right. The left leg is also shorter and thinner than the right, although the arrest of growth has been less in the leg than in the arm. The patient cannot stand on the left leg, and when he attempts to extend it completely, he feels a stiffness at the top of the calf. If he places the heel on the ground, and then lifts up the fore-part of the foot, it immediately drops—he cannot sustain it. He can bear no weight on the fore-part of the foot, and cannot bend his toes either upwards or downwards, except in a very slight degree. The tendo-Achillis has been divided. The right pupil is slightly the largest; the tongue deviates to the left side. The patient suffers from frequent and long-continued headache, on an average three times a week; if he gets up with it, it lasts all day. His back is peculiarly sensitive; he bursts into hysterical laughter the moment it is touched. The whole of the left side is habitually cold. Bowels constipated: not opened oftener than every other day. The patient's malady originated, his father says, in a fall on his left side when he was six months old. From this time the elbow was observed to be slightly bent, and the fore-arm always prouated. In his twelfth month the weakness was first noticed in the leg. In his third year he was taken to L'Hopital des Enfants Malades at Paris; then to "a private doctor," who bandaged the arm and hung a weight to it; he subsequently attended the Orthopœdic Hospital in London, where, in addition to other treatment, by galvanism, &c., the tendo-Achillis was divided; and, finally, he was a patient during two years at another Metropolitan Hospital.

My treatment of him consisted mainly in the application of ice along the spine, the only other measures adopted were, washing him all over every morning in cold water; clothing him in flannel down to the wrist and ankles; rubbing the back and paralysed side; galvanism as mentioned below; and making frequent efforts to supinate the fore-arm.

The patient's headache ceased from the time the ice was applied. By the 8th of June, the left arm and leg became quite warm; by the 15th, the bowels had become open daily, the preternatural sensitiveness of the back had ceased, and when the left heel was placed on the ground, the fore part of the foot could be held up during at least five minutes.

As early as July 14, the power of the whole left arm, either for movement or lifting objects, had greatly increased; the hand was much less flexed and drawn to the ulnar side than formerly; the metacarpal bone of the thumb, which even a fortnight before needed a good deal of external force to draw it from the palm, could then be abducted by the will of the patient himself; he could open the fingers, and extend them completely; and the third phalanx of the index finger, formerly paralysed, he could flex strongly. His left leg also continued to grow stronger; he could stand alone upon it without support for a considerable time; the stiffness formerly felt at the top of the calf, when he attempted to extend it, was completely gone; he could hold up the fore part of the foot when the heel was on the ground as long as he liked; he could move the toes, especially upwards much more freely, and, as he said, he walked "much better" than formerly. I ordered the extensor muscles of the fore-arm, especially those of the thumb, to be galvanized frequently; the treatment in other respects to continue the same.

The last record which I made of this case, was July 28, and was as follows:—When the hand is in a passive state it is now quite straight in relation to the fore-arm, and its grasping power is notably increased. The patient can walk on either the heel or toes of the left foot, and in ascending stairs can

bear all his weight so completely on his left toes, as to be able to go up by advancing each foot a step alternately. The bowels continue to be open daily; the left side continues remarkably warm, and during the two months of treatment headache has never been felt.

As the radial side of the fore-arm has been turned inwards ever since infancy, it is probably held in that position, not only by the pronator muscles, but by adherent tissue developed between the immobile structures. Holding this opinion, I directed the boy to make continuous efforts forcibly to supinate the fore-arm, and already the rotating power has increased. If his left tendo-Achillis had not been divided, he would now walk I believe, with only such a slightly perceptible limp as would be due to the difference in length of the two legs; there is more unevenness in his gait than that difference will account for, and I ascribe it to the operation which he underwent. Indeed he could walk better, he says, before the operation than afterwards; and he is probably right, for he also says that before the operation the muscles of the calf were fully developed, whereas afterwards they gradually wasted.

As in the treatment of cases of paralysis of long standing, medicines are, notoriously, of slight avail, and as any merely theoretical considerations which I may advance in favour of the method I am advocating will not be likely to exert much influence, I shall, I hope, be permitted to adduce, as evidence in support of that method, the reports of two other cases which were published in the Journal of Mental Science.

Case of Hemiplegia, with persistent headache; impairment of intelligence and vision; obstinate constipation; and deficient expulsive power of the bladder.—H. D. J., suffering from hemiplegia, consulted me, August 12th, 1863. He can lift the right elbow nearly as high as the shoulder, when the arm is flexed; but when extended, only as high as the mamma. The supra-spinatus muscle of the right side is considerably wasted. Can flex the fore-arm vigorously, but can extend it only imperfectly and feebly. Can flex the fingers and thumb closely, but not powerfully; cannot extend the fingers beyond a right angle with the palm; cannot extend the thumb. Cannot stand on the right leg without support; it is not wasted. Cannot extend the toes except very slightly; can flex them better, but much less than he can the toes of the left foot. The right foot and leg, as high as the knee inclusive, are habitually cold; so cold that even now he has a fire every night to warm them before going to bed. Drags his left foot, and wears the toe of his shoe out in consequence.

Has continuous pain on the right side of the head round the ear, sometimes extending to the back and front of the same side. Has constant singing in the right ear. Has paralysis of the sixth nerve of the left side. Has a little pain in the left eye; cannot read test-type "12" with it; with the right eye can read test-type "3" with difficulty. Tongue deviates strongly to the right side; tactile power of tongue and of cheeks on each side the same. In the palm of the hand feels two points six lines apart on right side, four on left. Intelligence considerably impaired. Pulse 120, the same strength on both sides. Bowels so constipated as to be confined for a week together if no medicine be taken, the stools being very hard. Even with several strong doses of purgative medicine in succession, very often no action of the bowels is effected. The expulsive power of the bladder is "greatly impaired." He sometimes passes twenty-four hours without making water. The patient is generally very impatient and irritable.

After the treatment, consisting chiefly of ice to the spinal region, varied from time to time according to the requirements of the case, had continued until September 24th, the following was the condition of the patient:—

He can now raise his right arm vertically above his head; can extend his fore arm vigorously, and all the fingers and the thumb completely. Can balance himself on the right leg without support. Can extend and flex the toes of the right foot very considerably, much more than formerly. The right leg decidedly warmer than before using the ice. In walking he can now put his left foot flat, there being no dragging of it as formerly. The pain of the right side of t hehead and the singing of the right ear, though not quiteg one are

markedly lessened. The pain in the left eye is still felt at times but it is also much lessened. The paralysis of the sixth nerve of this eye continues about the same. Can now read test-type "1½" with the right eye, and "8½" with the left. Feels two points at five lines apart in each palm. Intelligence very greatly improved. The bowels are now easily acted on by a slight dose of aperient medicine, and are thus open at least every other day. The expulsive power of the bladder is much greater than before treatment; in fact, quite normal. Urine is now voided about three times in the twenty-fourhours.

Case of Paralysis of the muscles of the tongue and throat.—September 13 1863, I was consulted by Mrs. ——, who, about four years ago, lost the power of her right hand for a time, but recovered it. A year later she had an attack of paralysis of the right arm, lasting only for a few days. The face was drawn to the right side, and the speech became "thick." She has never walked so strongly since this attack as she did before it. She had a third attack about thirteen months ago, when, having gone to bed well, she rose in the morning, and went to call her daughter, but found herself unable to speak. The arm was not affected at all this time. Both legs are now very weak, the right one being much the worst.

The tongue is still paralyzed, but its sensibility is normal. She can now protrude it slightly, and move it from side to side, but cannot speak at all. Formerly the tongue was stiff, and could not be protruded.

During the last two months, she has become able to swallow fluids with difficulty, only a teaspoonful at a time. Has all her food minced, being unable to chew it, because she cannot guide it in her mouth. Uvula straight. Pupils equal, and sight fairly good. Forehead, face, submaxmillary region, decidedly cool; upper extremities habitually cold. Sleeps well; appetite good; bowels regular. Goes out daily to walk, but feels a great stiffness in the limbs, particularly in the right leg and arm. The patient writes on a slate—"My nerves are greatly shaken; the most trifling thing makes me laugh or cry without any cause. I cannot account for this attack in any way. I have tried blisters, strychnine, galvanism, and homœopathy, without any effect. I have no headache nor pain of any kind, but often feel as if a band were bound round my head and throat (more round the throat than the head); and going up or down a single step, I fancy I must fall, though I know it is only a nervous feeling." I requested her to apply ice, until it melts, along the upper half of the spine twice a day.

September 20th. The patient looks better; the hands have been always warm since the treatment began, becoming so in three minutes after the use of the ice. Her expression is improved; she looks healthier, stronger. Pulse 92; tongue clean, bowels regular. ℞. Ammonii bromidii gr. v.; potassii iodidi gr. iiss, ter die.

September 27th. Feels very well: arms, but not hands, warm, bowels regular. Face often flushes while the ice is on. Can eat better, and can say "Helen" and "No." To make the hands warm by putting them in hot water, by friction, and by warm gloves. To continue the medicine already prescribed, once daily, and to take of ferri carbonatis cum saccharo gr. x, bis die.

October 3rd. Much the same, but has a little more power in the tongue. Can say "nothing." Bowels regular. Pulse 104. Continue the ice and the pills, and keep a roll of cotton wool beneath the lower jaw.

11th. Is generally better. Can say "Yes" and "Fire" and all the letters of the alphabet except "w" and "y." The wool beneath the jaw has much increased the temperature there. Is always warm, *except just after dinner;* she has not the ice on then. To continue the pills, to put the ice-bag next the skin, and to suck jujubes in order to exercise the tongue.

17th. Can now say "Bacon, finger, apple, paper, Mary, box." Hands warm, feet also. Pulse 100. Bowels regular. Tongue deviates to the right. Swallowing improved; takes a wine-glassful of porter daily. ℞. Potassii iodidi gr. iij, bis die. Continue the ice and the jujubes, and make continual efforts to speak.

I never saw this patient again.

Case of Chronic Hemiplegia, with extreme constipation and coldness of the paralysed side.—F. J., aged 27, consulted me November 6th, 1863. He had to be carried into my room. Became paralysed seven years previously. The elbow is immovably flexed, the fore-arm is pronated, the fingers and thumb are powerfully flexed into the palm of the hand. Can raise the right leg a little, but cannot flex it at all, the foot is drawn inwards, cannot move the toes in any way. The tongue can be only so far protruded as to get its tip over the teeth, can drink with great difficulty, and only very slowly, can bite, but cannot grind his food. Has wholly lost the power of speech. Breathes stertorously, and is often afflicted with an uncontrollable sardonic laugh.

Temperature of right hand 83° Fahr., of left 87°, of right leg 84°, of left 89°. Bowels habitually costive, open about twice a week, sometimes only once if aperient medicine is not taken; makes water with distressing frequency.

The patient came to me from Ireland, whither he returned after visiting me once. I ordered ice to be applied along the whole spine three times a day. Owing to his adverse circumstances the treatment was continued only a short time. May 18th, 1864, he wrote to me as follows:—"When three weeks had elapsed [after the date the treatment began] an obstinate constipation, from which I had suffered for years, seemed cured. The temperature of my paralysed hand rose considerably, and for the first time for six years I hobbled about with a walking cane, and continue to improve."

In answer to an enquiry concerning his condition, which I subsequently addressed to him, this patient wrote to me, May 7th, 1866, that "since the very imperfect trial of the ice treatment" immediately after he first consulted me, he had "failed in procuring ice except for a day or two," when, as he said, "we had frost here;" that, nevertheless, his improvement had continued; that he had begun to "mumble a few words;" that, "under favourable circumstances the palsied side is as warm as the other;" that "the bowels act very regularly;" and that, in respect to the excessive micturation with which he was troubled, "there is a grand improvement; for the last few weeks that failing has all but vanished, though it was nearly nine years old."

I regret extremely that this patient could not continue the treatment I advised; it is evident that it was doing him great good; and, to the extent of the benefit derived from it, the case would have afforded a still more decisive illustration than it is already of the remedial efficacy of the method in question, as well as an answer to an eminent London physician who saw the patient with me, and who then said to me, "Well, you don't expect anything can be done here, do you?"—*Medical Press and Circular, May 29, 1867, p. 502.*

DISEASES OF THE ORGANS OF CIRCULATION.

30.—DIGITALIS IN DISEASE OF THE HEART.

By Dr. J. Milner Fothergill, Morland, Westmoreland.

Both the experiments of Handfield Jones and Fuller show conclusively that in digitalis-poisoning the heart is found in a state of tonic contraction. Clinical observations, which of course, are much more numerous than physiological experiments, show also that under digitalis, in many cases an irregular pulse becomes much steadier, the beats becoming more equal and regular; clinical observation will show, too, yet another fact, not by any means so well known, that where a heart, with or without valvular disease, is beating so feebly that its apex-beat cannot be felt, that its sounds are inaudible almost, certainly undistinguishable, and the pulse almost imperceptible, under digitalis it becomes so altered that its apex-beat becomes perceptible; not only can the natural sounds, but, where present, the abnormal sounds can be clearly distinguished, whose presence before could only be suspected, and the pulse can be distinctly counted.

To illustrate its action, let me bring forward one or two cases. An old and

easy gentleman—with feeble irregularly-beating heart, with mitral regurgitation. who can scarcely walk round his garden, and is frequently brought in almost pulseless from cardiac syncope, requiring strong stimulants to keep the heart beating at all—in a few weeks after the administration of digitalis can walk two or three miles without discomfort; which state continues, and he has not had an attack of cardiac syncope for months—in fact since the treatment commenced. The dropsical patient—swollen, distended, breathing with the greatest difficulty, and often gasping in agony, his passively congested kidneys secreting only a few ounces of urine daily—under digitalis often leaves his bed relieved, his breathing easier, the œdema diminishing, and his kidneys, which before were unable to relieve the system, however goaded by diuretics, now secreting freely. And this not by its lowering the circulation, and thus relieving the renal congestion, as the old explanation ran, for in fact the heart beats more vigorously, the pulse is firmer; but because the blood now circulates more rapidly, is more readily brought in contact with the different depurating organs, and thus its watery portion more quickly excreted. Water is being constantly generated within the body, as one product of hydro-carbonaceous oxidation, and in the removal of it the kidneys have a great share; but unless the different portions of the blood are properly and quickly enough brought in contact with the depurating organs, elimination cannot be efficiently carried on. "It seldom succeeds in men of great natural strength, of tense fibre, of warm skin, of florid complexion, or in those of a tight and cordy pulse. On the contrary, if the pulse be feeble or intermitting, the countenance pale, the lips livid, the skin cold, the swollen belly soft and fluctuating, or the anasarcous limbs readily pitting under the pressure of the finger, we may expect the diuretic effects to follow in a kindly manner."—(Withering, quoted by Pereira.)

Another case particularly strikes me. A young woman of thirty, suffering from palpitation on the least exertion, was very weak, her pulse merely a tremulous motion,—for no distinct pulse could be ascertained,—the sounds of the heart were undistinguishable, and the impulse imperceptible, to this was added decided azoturia. Tonics of various kinds and variously combined, vegetable, mineral, with and without cod-liver oil, seemed to have no effect at all. At last, beginning to suspect that the state of the heart might be the cause and not the result, digitalis was administered; soon the pulse could be distinctly counted, but fast and irregular; the heart's sounds could be made out, and the condition of a simply dilated heart was clearly revealed. Synchronous with the improvement in the centre of the circulation was a decided improvement in the other symptoms; the debility was no longer so extreme; moderate exertion no longer brought on violent attacks of palpitation; the nutrition of the body was improved, and the patient went steadily forward. She had suffered a great deal of mental anxiety and "hope deferred." which had probably altered the innervation of the heart.—*Edinburgh Medical Journal, April* 1860, *p.* 876.

DISEASES OF THE ORGANS OF RESPIRATION.

31.—ON THE MECHANISM OF THE CREPITANT AND THE SUBCREPITANT RALE.

By Dr. Austin Flint, Professor of the Principles and Practice of Medicine in the Bellevue Hospital Medical College, New York.

[Laennec attributed the moist crepitant râle to the bubbling of liquid in the air-cells, the bubbles seeming to be extremely small. Dr. Flint in this paper shows that it is really owing to the sudden separation of the coherent surface of the air-vesicles. This he does by producing the râle artificially by means of a new commodity called the "patent india-rubber sponge." In 1842 Dr. Edson Carr communicated a paper to the American Journal of Medical Sciences, showing that in the first stage of pneumonia the air-vesicles contain a certain quantity of thick and tenacious matter.]

In the first edition of a work on physical exploration, written by the author of this paper, and published in 1856, Dr. Carr's explanation of the crepitant râle is adopted in the following terms: "The most rational theory, and the one which meets best the objections to that of Laennec, was offered several years ago by Dr. Carr, of Canandaigua, N. Y. Dr. Carr attributes the production of the sound to the abrupt separation of the walls of the cells which had become adherent by means of the viscid exudation incident to the early stage of inflammation. . . . . A viscid exudation within the cells and bronchioles belongs among the local phenomena of the disease (pneumonia); and as it is not readily removed by expectoration, but accumulates until the cells are filled, and the lungs solidified, the constancy of the râle for a certain time is intelligible. Its occurrence with inspiration only is fully explained by this theory. The conditions for the production of the sound are only present after the lungs have collapsed with expiration, when the agglutinated walls of the vesicles and bronchioles are separated with the expansion of the lung by the inspiratory act. Adopting Dr. Carr's explanation, it would be expected, as observation shows it to be true, that the sound would be present in the early stage of pneumonitis, the air in this stage still entering the vesicles, and subsequently cease, nearly or entirely, in proportion to the extent of the completeness of the subsequent solidification. The fact that, when solidification has taken place, a certain number of cells are not filled with the morbid exudation, and remain in the condition which characterizes all the cells in the early stage, explains the persistence of the râle in some cases during the second stage of pneumonitis, and its being developed, under some circumstances, by forced inspiration and especially at the end of the inspiratory act. The theory of Dr. Carr is also equally applicable to cases of œdema and hæmoptysis, in which the crepitant râle is observed. In these affections the vesicles contain a liquid which is glutinous, although in a less degree than in pneumonitis; and we can readily understand that the necessary physical conditions are present sometimes, but not constantly, on account of the greater facility with which the liquid escapes from the cells into the bronchial tubes, thus giving rise to the bubbling râles—the subcrepitant and mucous."

It would be affectation not to admit that I derive a certain degree of personal gratification in the demonstration of the correctness of Dr. Carr's explanation, from the fact that no other work on auscultation, within my knowledge, has adopted this explanation. Of prominent contemporaries I may name Barth and Roger, Fuller, Gerhard, Bowditch, Hughes, Blakiston, Latham, Gairdner, and Skoda (London edition, 1853), as adhering to the bubbling theory. Gerhard, in his treatise on the chest, edition of 1846, attributes the râle in part to bubbles, and in part, to "the dilatation of the thickened and stiffened vesicles." My friend Dr. Loomis, of this city, in his recent publication, entitled "Lessons on Physical Diagnosis," after stating that there are two views as to the mechanism, viz., one attributing it to bubbling, and the other to the separation of the walls of the air-cells glued together by a viscid secretion, expresses the opinion that "it may probably be produced in both these ways." He introduces, however, a diagram from the work on diagnosis, by Da Costa, in which bubbles are figured within the air-cells. In the late work on Internal Pathology and Therapeutics, by Niemeyer, I find the following sentence: "Perhaps it (the crepitant râle) originates in the following manner: the alveolar walls are glued together by a viscid exudation during expiration, while they are forcibly separated by the entrance of air during inspiration."

The opinions which have been noticed relate to the mechanism of the crepitant râle. As regards the subcrepitant râle there have not been differences of opinion. That this is a bubbling râle no one can doubt. The character of the sounds, their occurrence in both inspiration and expiration, the inequality of the sounds which enter into the râle, and the comparative slowness of their evolution, constitute adequate evidence of bubbles.

For my knowledge of the artificial production of the crepitant râle in the way I am about to describe, I am indebted to my friend and associate, Dr.

Henry F. Walker. Dr. Walker happened to purchase an articled labelled "Patent India-rubber Sponge," which is designed to take the place of the ordinary sponge for the toilet. This article consists of a block of india-rubber which has been made to assume a cellular arrangement, evidently by the introduction of air or gas while the substance is in a liquid state and during its congelation. On examining the article, it will be seen to be made up of cells of unequal size, the appearance being very like that of a portion of emphysematous lung. The elasticity of the india-rubber causes the article to expand after it has been compressed, the well-known cohesiveness of this substance offering a certain amount of resistance to the expansion. Now, after having examined the structure, if each one present will compress with the finger the article which I shall ask you presently to pass around, holding it close to the ear, and then allow it to expand, it will be at once perceived that a crepitant râle is beautifully represented. The fineness and the dryness of this râle are perfectly exemplified. It will be observed that the compression of the article causes no sound. This act of compression is to be considered as taking the place of expiration. The expansion is analogous to the movement of the lung in inspiration. The compression brings the walls of the cells into contact, and, from the adhesiveness of the substance, they cohere with a certain amount of force. There being no liquid present, the râle must be produced by the separation of the cell-walls by the elasticity of the substance. The intensity of the crepitation will be found to be proportionate to the force of the compression, the cell-walls being brought more completely into contact and the cohesion being greater according to the amount of compressing force.

Purchasing the article for another purpose, Dr. Walker was led to notice this unexpected application, and being associated with me in giving practical lessons in auscultation, he called my attention to its usefulness, as affording an exact representation of the crepitant râle preparatory to the demonstration of this sign in cases of pneumonia. It is indeed highly useful for this purpose. But, in addition, it serves to demonstrate that the crepitant râle in cases of disease is produced, not by bubbling, but by the separation of the coherent walls of the cells and bronchioles. The representation of this sign is so complete by means of this article, that I do not see how any one can doubt that the mechanism is the same. I assume, therefore, that the explanation of the crepitant râle, published more than twenty-five years ago, by our countryman Carr, is proved to be the true explanation; and I claim in behalf of his memory the credit of the explanation which, by the author of the article on Auscultation, in the new French Dictionary of Medicine and Surgery, is accorded to others. As a friend of the late Dr. Carr, I cannot but have a feeling of regret that he did not live to see the correctness of his explanation established. As it is, justice to his memory, in respect of the originality and priority of the explanation, will be gratifying to numerous friends who held him in high esteem for his professional attainments and private worth.

The production of the crepitant râle, in the manner now illustrated, demonstrates the error of attributing the fineness of the râle to the small size of the cells. The fineness is not less marked when produced by the india-rubber sponge than when it emanates from the pulmonary vesicles and bronchioles. Dr. Carr's mode of illustration, by pressing together and separating the finger and thumb moistened with thick paste or mucilage, also demonstrates this error.

In concluding my remarks on the crepitant râle, I will refer to an explanation of the peculiar quality of the inspiratory sound in the normal vesicular murmur, which, so far as I know, is original with me. Quoting from my work on physical exploration (2nd ed., p. 133), I say with reference to this point as follows: "May not the peculiar quality (called the *vesicular quality*) be owing to the separation of the walls of the cells, or bronchioles, which, to a greater or less extent, are in contact, and owing to the moisture of the tissues become slightly adherent during the partial collapse of the lung at the end of an expiration? We shall see hereafter that this is the most rational explana-

tion of an important and highly distinctive physical sign of disease, namely, the crepitant râle. The fact that the air does not circulate freely in the air-cells and bronchioles with each inspiratory act, renders probable the explanation suggested by the foregoing inquiry. Other facts supporting this explanation are, the increase of this peculiar quality of sound in the inspiratory act which succeeds a forced expiration in the act of coughing; the diminution of the quality in cases of permanent dilatation of the air-cells, or emphysema, and the limitation of this quality to the inspiratory sound." In view of the demonstration of the mechanism of the crepitant râle, the correctness of the explanation of the vesicular quality in normal respiration, which is offered in the foregoing quotation, seems to me extremely probable. We have the crepitant râle in pneumonia, because the air-vesicles and bronchioles are glued together at the end of expiration by a viscid morbid product. We have a slight approach to this râle in health, in the vesicular quality of the inspiratory sound, because the air vesicles and bronchioles are very slightly coherent at the end of expiration. The peculiar quality of the inspiratory sound in the normal vesicular murmur, Laennec compared to a "slight crepitation," but in view of his theory of the crepitant râle he could not, of course, suppose that the mechanism of this slight crepitation and of the crepitant râle is the same.

A good imitation of the vesicular quality in the inspiration of health is obtained by wetting a fine ordinary sponge, squeezing it as dry as possible, then compressing it, and allowing it to expand close to the ear. The liquid may be so effectually squeezed out of an ordinary sponge that there is not enough left for bubbling; but the moisture occasions a very slight cohesion of the cells when pressure is made, and the expansion gives such an approach to crepitation as constitutes the vesicular quality in the normal vesicular murmur. This mode of representing the vesicular quality goes to prove its mechanism.

Concerning the mechanism of the subcrepitant râle, as already stated, there is no difference of opinion. This râle is produced by the bubbling of liquid; it is therefore essentially different from the crepitant râle. The article which, as has just been seen, represents crepitation, may be used to exemplify the subcrepitant râle, and to illustrate certain points relating to the differentiation of the two râles. The application of the "india-rubber sponge" to show the mechanism of the subcrepitant râle was suggested by Dr. William J. Chandler, one of the house physicians at Bellevue hospital. If a portion of the "sponge" be compressed and allowed to expand under water, the cells are filled with liquid; and now, holding it close to the ear and alternately pressing it and relaxing the pressure, fine bubbling sounds are produced. That bubbling is caused by the pressure, is shown when the portion of "sponge," of the cells filled with liquid, is compressed under water; small bubbles, of unequal size, in great abundance, rise to the surface. This artificial subcrepitant râle is produced alike by the pressure of the "sponge," and by the expansion after the pressure; thus, the fact of the occurrence of this râle, as a morbid sign, in both inspiration and expiration is illustrated.

The bubbling, as thus produced, is very fine, and the resemblance of the subcrepitant to the crepitant râle is admirably shown by producing alternately, with two portions of "sponge," one portion dry and the other filled with liquid, the representation of the two râles. This may be practised with advantage in order to exercise the ear in discriminating the differential characters of these two râles.—*New York Medical Journal, Feb.* 1869, *p.* 449.

32.—ON THE USE OF ETHER AND ETHERISED COD-LIVER OIL IN THE TREATMENT OF PHTHISIS.

By Dr. Balthazar W. Foster, Physician to the General Hospital, Birmingham.

[It is only of late years that the disorders of digestion associated with pulmonary tubercle, have attracted special attention. The difficulty of assimi-

lating fat is the one characteristic of the dyspepsia of phthisis, occurring in 75 per cent. of consumptive cases.]

The greatest step made for many years in the treatment of consumptive patients was the introduction of cod-liver oil; and Dr. Hughes Bennett, to whom we owe this great boon, expressly states "that the great obstacles the practitioner has to contend with are the dyspeptic symptoms." In cod-liver oil was found a form of fat which could, in many cases, be digested even by the impaired organs of consumptives; but the next step, viz., the search after some means of augmenting the secretions which are specially devoted to the digestion of fatty matters, has been hitherto neglected or unsuccessful. To pour oil into a patient's stomach, without at the same time taking measures to ensure its digestion, has always appeared to me a crude kind of therapeutics. Its simplicity has, it would seem, recommended it to the routinist; for there is probably no single remedy used in any disease with so little preliminary inquiry into the conditions favourable to its action. Experimental physiology has taught us that the only fluids in the body which have the power of acting upon fat, so as to render it fit for absorption, are the secretions of the pancreas and the duodenal glands. To these secretions therefore, we must look for assistance in the treatment of phthisical patients by cod-liver oil, for on the action of these glands must the assimilation of the remedy depend. And such healthy action can scarcely be supposed to co-exist with the inability to digest fat, which is so frequent in the disease under notice. As Bernard has shewn, the chief of these glands (the pancreas) is most sensitive to nervous influences, ceasing to form a healthy secretion from very slight irritation, and even from emotional influences. This fact, taken together with our knowledge of the peculiar character of the dyspepsia of phthisis, justifies the assumption that the pancreatic secretion is disturbed. Not long since, Dr. Dobell, holding these views, made some experiments with pancreatic emulsions of fat and pancreatine, which supported this interpretation of the phenomena, and shewed that fat when emulsified is more readily digested than in any other form. In this paper I have, however, to propose a mode of treatment which should, I think, in all cases precede the use of such remedies as pancreatic emulsion, because it aims at remedying the disorder, not by artificially complementing the defective secretion, but by stimulating the glands to renew their healthy action. Instead of throwing into the system a substance which may be yet formed in physiological quantities, it endeavours to promote the normal flow of pancreatic juice.

The drug which gives us this power is *Ether*, and I now propose to lay before the meeting the evidence of its physiological action, and afterwards to speak of its therapeutical effects. I had long sought, and sought in vain, for some means of acting on the pancreas in the treatment of phthisis, till one day, two or three years ago, when reading Claude Bernard's elaborate investigations on the properties of pancreatic juice, I found the long looked for clue; stated, indeed, so simply, and brought out in successive observations and experiments so clearly, that it has ever since been a matter of surprise to me that no previous reader should have seen the importance of the facts to practical medicine. In the following extracts, I lay before you the evidence of our greatest living physiologist on the mode of stimulating the secretions of the pancreas. The first passage which arrested my attention was the following, which occurs in Bernard's Leçons de Physiologie Expérimentale appliquée à la Médecine, tome ii., p. 226. "The nervous influences which directly excite the secretion of the pancreas are much more difficult to determine than those which act on the salivary glands. In a dog, with a tube fixed in the pancreatic duct, I have galvanised the solar ganglion of the great sympathetic without a result, clearly shewing any modification of this secretion. *But I have seen ether introduced into the stomach determine soon afterwards a considerable flow of pancreatic juice.*" This statement was so clear and unmistakable, that I at once proceeded to search in Bernard's other works for its confirmation. From his Leçons sur les Effets des Substances Toxiques et Médicamenteuses. Leçon 29, p. 426, I extract the following: "I would remind you only of the influence of ether on the intestinal

secretions. Ether is reduced to a vapour when introduced into the stomach, and may rupture it. When, however, this accident does not occur, then may be noticed a vascular congestion of all the digestive tracts, but this congestion never attains to inflammation. At the same time, the secretions are rendered active and the rapidity of absorption is notably augmented. These last effects to establish the non-inflammatory character of the congestion of the mucous membrane, for it is known that on an inflamed surface the secretions are dried up and absorption becomes more difficult....The turgescence of the mucous membrane of the intestine, as well as the liquids secreted, present the same characters when produced by ether as when they are caused by their normal excitant—food. In comparing the pancreas of an animal, opened fasting, with that of an animal opened during the process of digestion, a great difference of colour, due to the difference of vascularity, is observed. After the administration of ether the pancreas becomes red and turgescent, as it is during digestion, and its secretory function is proportionally increased by the afflux of blood. I have accordingly been able to avail myself of this procedure to obtain pancreatic juice. Normally, this fluid discharges by drops more or less infrequent, but when a little ether is given to an animal having a pancreatic fistula, this discharge is seen to become more abundant, without the secreted liquid having lost any of its physico-chemical characters." Demonstrating these facts to his class, the Professor continues: "Here is a rabbit, upon which we will show you the increased secretion under the influence of ether. The pancreatic duct is laid bare, and into it there is introduced a smaller silver tube. The intestines of the animal are red and very vascular, and contain ether in vapor. The tube introduced into the pancreatic duct plainly gives passage to a very active flow of pancreatic juice, while under ordinary conditions the liquid only flows out drop by drop with an activity much less." In another place (p. 422) summing up the results of his experiments, and alluding first to the effects of ether in promoting absorption of fatty matters, he says:—"Finally, in our experiments, the injection of the lacteals is due to the abundance of the pancreatic secretion, and to the extremely fine state of division of the fatty matters which occurs in the intestine. It is due, also, to *the absorbing power having been augmented by the ether.* This activity of absorption has been observed in the case of several poisons. We have already mentioned that the combination of ether with poisonous doses of strychnia and nicotine produced death more rapidly in the animals on which we experimented. The action of ether introduced into the digestive organs is, therefore:—1. To stimulate all the intestinal surface. 2. To stimulate the secretions which are poured into the intestine. 3. To modify and decidedly increase the absorbing power." In a short passage (page 428), at the end of the experiments referred to above, the following passage occurs:—"Ether increases the absorption of fatty matter, which it places at once in a state of fine division, and in contact with a more abundant secretion of pancreatic juice. In this way it produces a very marked white injection of the lacteals."

If necessary, I might multiply these extracts still more, but enough has, I think, already been quoted from the works of our first experimental physiologist to teach us the physiological action of ether. This action is twofold: (1) it stimulates the pancreas and glands of duodenum to pour out their secretions freely, and (2), at the same time, it facilitates the absorption of those very substances which these secretions are designed to digest. In other words, ether not only obtains for us the secretions required to digest fats, but promotes the absorption of these fats when digested. Can any physiological action be more clear, or any experimental proof be more satisfactory for the end we have in view?

I now come to the second part of my task; namely, the therapeutical application of the foregoing facts. Having found as I considered, sufficient evidence of the special action of ether on the pancreas, I determined to test the value of the discovery by administering ether in all cases characterised by inability to digest fat. In the out-patient departments of our hospitals, many such cases occur, which are generally classed as dyspepsia. Many

cases of neuralgia are also to be met with in which a most decided improvement follows the increased power of absorbing fatty food. To both classes of patients I gave ether sometimes in combination with cod-liver oil, sometimes alone before meals. The results were most satisfactory; the oil was digested more easily and the nutrition of the patient greatly improved. Of these cases I shall speak more fully on a future occasion. I next ordered ether in mixture to all my phthisical patients at the General Dispensary, selecting the Dispensary for my investigations, rather than the Queen's Hospital, because all the patients were out-patients, and consequently exposed to no new and favourable conditions while the experiment was being tried. The patients being also of a somewhat better class than those attending the hospital, were not, as is so often the case in our large towns, struggling to combat mortal disease while suffering from the effects of disease's chief ally—improper and insufficient food. For some months I pursued the treatment, seeing a very large number of consumptive cases, to all of whom ether either alone or in conjunction with cod-liver oil was administered; and the good effects were so decided, that I determined to investigate the subject more methodically, and to keep a careful record of each case. The good results observed in this preliminary inquiry were a return of the power of taking oil and fatty food, which had been previously distasteful or had even excited sickness; increased appetite, improved general nutrition and increase of weight, diminution of cough and expectoration, and cessation of night sweats. The general impression produced on my mind was so favorable that I began my more exact inquiries with much confidence. In my first cases, the ether had been given in water with hydrocyanic acid and bicarbonate of potash, twenty minim doses of ether to each ounce of the mixture. The ether was afterwards added to cod-liver oil, the æther purus of the Pharmacopœia being used, and about ten minims (9·259 m.) added to every two drachms of oil at first, afterwards fifteen and twenty minims were occasionally given in the same quantity of oil. In some cases the ether was administered in water alone, and taken a short time before the oil. The effects were similar in all cases; but for convenience sake, and on account of its power of masking the unpleasant properties of the oil, I now, generally, give ether mixed with cod-liver oil, in the proportions mentioned. In my second and systematic inquiry, I treated fifty cases taken as they presented themselves at the dispensary, each patient being carefully examined on admission and at least once every fifteen days during treatment. A brief record was kept of the progress of each case; but from former experience, I determined in this inquiry not to accept the statement of the patients themselves as evidence of improvement, but only to consider those patients better in whom the result of a physical exploration of the chest, in addition to *decided increase* in weight, confirmed the statements made. I therefore weighed every patient once a week. As it would be impossible to give a record of each case in a communication such as the present, I must confine myself to a brief statement of the results obtained in the fifty cases.

Sixteen were admitted in the first stage of the disease; nineteen in the second stage; and fifteen in the third.

Of the sixteen in the first stage (or stage of deposition) seven improved in general symptoms and in physical signs, gaining on an average over 7½ lbs. each; five remained stationary, all gaining weight slightly; and only four became worse.

Of the nineteen cases in the second stage, six improved in all respects, gaining on an average about 8 lbs. each, two cases gaining 14½ lbs. and 10 lbs. respectively; six remained stationary; and seven became worse.

Of the fifteen cases in the third stage, seven improved, gaining on an average, about 5 lbs. each; five remained stationary; and three became worse.

Of the total fifty cases, twenty improved, sixteen remained stationary, and fourteen became worse.

Six of the cases treated, in no instance for a less time than three months, and observed over a period of many months, retained their weight; were

troubled by no symptoms, and maintained the improvement in their physical signs. Only one of these were observed over a less period than fifteen months, three over two years, and two over eighteen months. These cases may be considered, I think, as examples of the arrest of the disease, for the patients have returned to their ordinary avocations, and are able to earn their livelihood untroubled by their former disease. The only other remedies used in those cases were croton ointment, as a counter irritant, Dover's powder occasionally to relieve the cough, and in a few cases, a little linctus morphiæ. But as cod-liver oil was administered, as well as ether, the objection may very naturally be made that improvement was due to the use of the oil. For my own part this objection has not much value, for I had long used oil largely without obtaining any results at all equal to those stated. In order, however, to meet this objection the ether was stopped in ten instances, and the oil continued; six times there was a fall in weight during the following three weeks. In one case the patient, who had taken ether for some two months, continued to gain weight. In the three other cases the gain ceased, but was again observed in these patients, as it was in all, when ether was again administered.

These results are not only instructive, as showing the effect of ether in increasing weight, but also as showing that the digestion of fatty food is restored to its normal state, in many cases, after a long course of ether. In the cases which have done best under treatment, that is, the cases which I think we may consider instances of arrested phthisis, the power of taking fats, which was at one time much impaired, has returned, and the gain in weight has been maintained over a period of many months. I may here also add that, in all the fifty cases there had been marked wasting before my treatment was adopted, in at least half the cases, cod-liver oil notwithstanding. Many of my patients have over and over again expressed their preference for the etherised oil; and many who have been unable to retain ordinary oil when taken, have been able to use etherised oil, not only without disagreeable symptoms, but almost with pleasure; "to drink it from the bottle," as some have expressed it.—*British Medical Journal*, *Nov.* 21 *and* 28, 1868, *pp.* 543, 570.

33.—RAWNESS OF THE TONGUE AND PAINFUL DEGLUTITION IN ADVANCED PHTHISIS.

By Dr. Douglas Powell, Physician to the Hospital for Consumption, Brompton.

[The following is a note of the treatment which Dr. Powell employs with success in the above distressing complication.]

The combination of remedies most beneficial in these cases, which must be familiar to all and require no illustration, consists of chlorate of potash and glycerine in some syrup containing morphia. The proportions Dr. Powell commonly uses are—chlorate of potash, forty to sixty grains; glycerine, half an ounce; syrup to four ounces, with morphia, one grain and a half to two grains. A teaspoonful swallowed slowly acts locally on the parts affected, relieving at the same time the cough. Of course, in the latest stage of the disease this will but render the remaining hours of life more comfortable, or prolong life a little; but there are some cases where the disease of the lungs is considerable, though not incompatible with life, and the patient having been reduced very low by diarrhœa, vomiting, &c., this condition of tongue and throat will come on, and, rendering the taking of nutrients or stimulants almost impossible, the patient therefore dies from exhaustion. Indeed, the aphthous condition which follows this is usually considered a fatal sign in chronic disease; but it is not necessarily so. In these cases the above remedy relieves pain, cleanses the tongue, and enables the patient to take nourishment and remedies which greatly prolong life.—*Lancet*, *Dec.* 19, 1868, *p.* 799.

34.—ON THE TREATMENT OF ASTHMA BY BELLADONNA.

By Dr. Hyde Salter, F. R. S., Senior Physician to Charing Cross Hospital.

[Dr. Salter in the introductory part of this paper states that he has during the last two years used belladonna extensively in the treatment of asthma, and with very satisfactory results.]

If I were to express what appears to me to be the peculiar excellence of belladonna as a sedative in asthma, I should say it consisted in its power of diminishing reflex irritability—a power which it appears to me to possess in a degree greater, in proportion to its other sedative effects, than any other sedative.

My method of giving it will be best seen in the following cases. I do not know that the tincture has any advantage over other preparations, only it happens to be that which I have tried. I should think that the liquor atropiæ might, from its uniformity of strength, be even preferable.

Case 1.—R. G., a lady aged 25, who has been liable to hay fever for eleven years, and to asthma for seven, came to me on May 18th, 1868, for the cure of her hay asthma. She had been suffering for nearly a month, and had not had a single night's rest. She was not troubled with her asthma by day, but only with her hay fever symptoms. As soon, however, as she went to bed on came her asthma; and lasted regularly all night. She was worn out for want of rest, and felt fagged and miserable. I ordered her ten minims of the tincture of belladonna three times a day, telling her to increase the quantity, day by day, till the characteristic effects of the drug were produced. She gradually raised the dose from ten minims to twenty. She felt better the first night after taking it. She took it for nine days, and had no asthma whatever. She then, thinking herself cured, and feeling her head very uncomfortable, omitted it for one day, and the following night got no sleep from asthma. She then resumed it, and has had no asthma since. She now regularly takes twenty drops three times a day. Her head is slightly affected, and her eyes decidedly so—misty, and she cannot read; but there is not a trace of asthma. She has never found anything else prevent the attacks. The belladonna seems to have no influence whatever over the other hay-fever symptoms; the sneezing, running at the eyes, &c., go on as before.

Case 2.—Sarah P., aged 46, has had asthma ever since she was nineteen years of age—that is, for twenty-seven years. For the last five months she has been worse than ever, and for some time past has had asthma regularly every night. It begins between two and three o'clock, and after that she gets no rest. I ordered her to take the tincture of belladonna every night on going to bed—to begin at ten minims, and gradually to increase the dose till her head and sight became affected. She came to me on the 29th of last July. On the 14th of August I find the following entry in my note-book:—"This patient came to me a fortnight ago yesterday. She has almost completely lost her symptoms ever since, having had uninterrupted good nights. She has gradually reached thirty drops of the tincture of belladonna, and now takes it every night. She looks wonderfully better, and is able to take long walks." From that time I have not heard anything of her.

Case 3.—Col. R., aged 40, has had asthma for sixteen years. For the last few years it has been gradually getting worse, and now he has it almost every night commencing at from one to two o'clock a.m. He has tried various things without any success—Indian hemp, chlorodyne, ether, the inhalation of chloroform, dry cupping, coffee, iodide of potassium, abstinence, &c. I saw him on September 16th, and ordered him to try the belladonna at night in the usual way. On the 23rd I find the following note:—"He has gradually got the belladonna up to forty minims without any appreciable inconvenience. The nights have been very good. The two last mornings there has been no oppression whatever, nor any sitting up in bed; he has slept right through the night. He walked this morning, directly after breakfast, from his house at Blackheath to the station—a mile—in sixteen minutes, and

the same pace up from Charing-cross station here." I have not seen him since.

Case 4.—Wm. P., aged 38, has been asthmatic seventeen years. His attacks come on every morning on rising from bed, but often trouble him throughout the day as well. There is defective respiration at the right base, violent paroxysmal cough, and a good deal of expectoration. This patient came to me on Oct. 13th. A week after I made the following note:—"Since coming to me this patient has taken the belladonna every night—twenty, twenty-five, and then thirty drops, to which last dose he has stuck. The result is that he is quite a different man. He has slept all through the night, dressed himself without any trouble or difficulty, and has walked half over London as quickly and well as ever he did in his life. When he arrived in town his breath was so bad that he had the greatest difficulty in getting from Vauxhall station to the church near the bridge. He spits hardly anything. There is now a complete absence of all musical wheezing, and of any adventitious sound whatever: respiratory murmur quite re-established at right base, and indeed perfectly natural everywhere. And this change has taken place in one week."

I believe one reason why belladonna has not had a greater reputation as a remedy for asthma is that it has not been given in large enough doses. I think that, like lobelia, it must be given in doses sufficiently large to produce its physiological effects, otherwise we have no right to say that it has been fairly tried, or to conclude that it has been a failure if it has not achieved a cure. I think to give ten minims three times a day in some mixture is simply worthless. I have seen now numberless cases in which belladonna and lobelia have been consigned to the limbo of failures, when a fresh trial of them, on the plan of gradually increasing the doses till an ultimatum has been reached, has proved them to be perfectly successful remedies. Sometimes, but very rarely, belladonna will relieve asthma when given short of a physiological dose; sometimes, but still rarely, it fails to give any relief even when pushed to its full physiological effects; the common thing is for it to fail till so pushed, and then to succeed. When I find belladonna has only been taken in the ordinary small doses, without any increment, I always regard it as not having been tried at all.

The advantages of administering it in the way I have described are:—

1. That, giving it at night, you bring the full force of the drug to bear upon the disease at the time at which it is most liable to come on, and thus, if you are successful, tide your patient over the critical time.

2. By gradually feeling your way up to the required dose, you are able ultimately to reach without fear a dose which you would be unwilling to prescribe without such a tentative approach.

3. In those cases in which the therapeutical dose is reached before the physiological—that is, in which the asthma yields before the sight or head is appreciably affected,—it enables you to stop short as soon as relief is obtained, and thus spare your patient any of the disagreeable effects of the drug.

4. By giving it only once in the twenty-four hours, you are able to give a larger dose than you would be able to do if oftener repeated.

5. By confining the dose to bedtime, the patient's days are, in spite of a large dose, passed in comfort; for, as the morning advances, the dulness of head, confusion of sight, and drought of mouth pass away.

6. You are thus enabled to find out what is the dose for the individual—a very important point. People differ very much in their tolerance of belladonna. Some of my patients have been unable to take more than twenty minims once in the twenty-four hours without very unpleasant symptoms; while I have known others able to take a drachm three times in the same interval without any inconvenience. And as they differ in their tolerance of the drug, so do they differ in the dose at which their asthma will yield. The only way to ascertain what that dose is, is to make each case a separate experiment, and this can only be done in the way I describe.

7. By giving the remedy three or four hours before the attack is likely to come on, the treatment becomes *prophylactic*. If by taking a dose every

night for thirty nights the attacks have been for that time prevented, the patient has ceased to be an asthmatic for a month. This is a very different thing from having had thirty attacks in the same time which have been cut short by the remedy. In all "habitual" diseases, in which the recurrence keeps up the tendency, prophylactic treatment has, in relation to final cure, a pre-eminence it does not possess in diseases in which habit has no place. For such diseases it is *the* treatment. It does more than spare your patient an attack of his malady; it breaks, *pro tanto*, that chain of sequences which is the very life of the morbid tendency.—*Lancet, Jan.* 30, 1869, *p.* 152.

35.—BROMIDE OF POTASSIUM IN SPASMODIC ASTHMA OF CHILDREN.

Herr Sondahl reports a very interesting case in which he tried this remedy, on account of the recommendation of it by Dr. Warburton Begbie (Edinburgh Medical Journal, 1866). The patient was a child of fourteen months, of very fatty development. He was first attacked with spasms of dyspnœa early in 1866. By dieting (modified Bantingism) and the use of emeties, expectorants, and Carlsbad water, he improved for a time, but towards the end of September he relapsed. The distress became extreme; hardly any sleep was obtained; the urine was nearly suppressed; general œdema at last set in and all the symptoms were excessively bad. All manner of narcotics, expectorants, and anti-spasmodics having been vainly tried, Sondahl resorted to the bromide. It was given in six-grain doses, in syrup, every two hours. A most remarkable improvement was rapidly produced; the dyspnœa subsided, the lividity of the face and œdema disappeared, the secretion of urine returned, and sleep was obtained without difficulty. In seven days from the commencement of the bromide treatment, the little patient was substantially convalescent. Sondahl has also obtained excellent results with the bromide in a case of asthma in a boy of fourteen. In two old asthmatic patients, on the contrary, no good effects were obtained; neither the spasmodic symptoms nor the cough were relieved.—*Practitioner*, *Feb.*, 1869, *p.* 121.

DISEASES OF THE URINARY ORGANS.

36.—ON EXCESS OF UREA IN THE URINE IN CERTAIN FORMS OF DYSPEPSIA AND NERVOUSNESS.

By Dr. Henry William Fuller, Physician to St. George's Hospital.

In the year 1846 I had occasion to examine the urine of a patient who was suffering from symptoms of a nervous and dyspeptic character. The urine was frothy, somewhat pale, and clear, sp. gr. 1025; it had an acid reaction and a strong urinous smell; it contained neither sugar nor albumen, and only a few small crystals of oxalate of lime were visible under the microscope, but the addition of nitric acid caused intense effervescence, and about twenty minutes after this had subsided crystals of nitrate of urea began to form and ultimately filled the interior of the test-tube. During a period of rather more than three weeks I examined this patient's urine every second day, and invariably found it to contain urea in quantity sufficient to crystallize readily on the addition of nitric acid, without any previous evaporation or concentration of the urine. The degree of crystallization varied at each examination, in consequence, doubtless, of a variation in the amount of the urea contained in a given bulk of the urine; but inasmuch as I could not persuade the patient to save and measure the quantity of urine voided in twenty-four hours, I am unable to state whether less urea was secreted when the crystallization was at its minimum, or whether the variation arose from an increase in the quantity of water and a consequent dilution of the

urea. The patient, however, declared, as the result of his observations, that he was passing about two pints of urine, and that the quantity scarcely varied from day to day.

The patient was thirty-seven years of age, of spare habit, in good condition, and apparently healthy; he was not a large eater, but he relished his food, and ate meat three times a day. His principal complaint was of nervousness and depression of spirits, indisposition for exertion, whether mental or bodily, and dyspepsia, with irregularity of the bowels, acidity of stomach, and excessive flatus.

The case made a strong impression on me at the time, for the reason that I was not prepared for the discovery of so much urea, and had never heard such cases spoken of by my professional friends or seen any notice of them by authors. I have therefore kept the matter steadily in view, and within the last two years have examined the urine of every patient in whom, judging from the character of the symptoms, I have thought it likely that urea might exist in excess. The result has been that I have detected urea in excess in twenty-seven cases, and so well marked and peculiar are the symptoms by which that condition of the urine is accompanied, that now, if the features of the patient's malady induce me to suspect its existence and to examine the urine with a view to its discovery, I am seldom disappointed in obtaining the characteristic crystals of nitrate of urea.

The cases under discussion resemble each other so closely in many of their more prominent symptoms, that it will suffice to give the details of one or two which may be fairly taken as samples of the whole.

A. T., aged 43, a spare but healthy looking man, 5 feet 8 inches in height, 10 stone 9 lbs. in weight, and florid complexion, but somewhat bilious temperament, reported that he had been nervous throughout his life, and since the age of thirty had not felt well for any lengthened period. If he had unusual worry in his profession or any anxiety in his family, or even if he was unable to obtain his ordinary amount of outdoor exercise, he was apt to become irritable, low, and depressed, indisposed for exertion, and easily fatigued, unable to fix his mind on any subject requiring continuous application, and afraid to encounter the rubs and vexations incident to his daily life. His present illness he attributed to anxiety arising from the illness of one of his children, together with the want of his usual exercise. He had been remarkably well for some time previously, and became conscious of some change or disturbance in his system within a week after the commencement of his trouble. At first he became restless at night; then drowsy after meals, especially after dinner, and began to suffer from flatulence and acidity; shortly he found himself nervous and dejected without obvious cause, especially in the morning, unable to apply himself to his professional duties, and unwilling, if not unequal, to take his wonted exercise. Nervous fancies and wretched feelings, occasional giddiness, fugitive pains in various parts of the body, and a sense of extreme languor and weariness, rendered his life miserable. For six weeks before he consulted me he had been taking a series of Turkish baths, and had dieted himself carefully, but notwithstanding his care the dyspeptic symptoms had continued, and his mental disquietude was more constant than before.

When I first saw him he was restless at night, but obtained a fair amount of unrefreshing sleep; his skin was rather dry, but perspired readily after exercise; his pulse ranged from 84 to 96; his appetite was tolerable, but not so good as usual; he ate meat twice a day, and was in the habit of drinking four or five glasses of sherry or an equivalent amount of claret, but he never drank beer; after each meal he suffered greatly from flatulence and drowsiness, and after breakfast experienced a sense of uneasiness about the head and of heat and weariness of the eyes. His bowels were somewhat torpid, but usually acted without the aid of medicine; his urine he said was "all right," and with the exception that it was frothy or strongly beaded it certainly did not present an unhealthy appearance. Occasionally it threw down a deposit of the lithates, but more commonly it was clear, pale, acid, of a strong urinous odour, sp. gr. 1026, and was free from sugar and albumen.

Under the microscope a few octohedral crystals of oxalate of lime and here and there a few epithelial cells were visible, but they were scarcely more numerous than in healthy urine. On the addition of nitric acid to the extent of about one-third of the bulk of the urine a strong effervescence took place, and within twenty minutes after this had subsided crystals of nitrate of urea had formed to such an extent that the whole of the urine in the test-tube appeared to be converted into a solid mass. On some occasions the crystals of nitrate of urea did not occupy above half the bulk of the urine, but commonly they filled two-thirds of the space occupied by the urine. My friend Dr. Dickinson, who kindly examined a sample taken from the entire quantity of the urine (1927 c. c.) voided in twenty-four hours, reported that the day's excretion contained 53·9 grammes of urea, or nearly 21 grammes in excess of the average amount excreted within that period according to the observations of Dr. Parkes.

The next and only other case which I shall detail is of a very similar character. The patient, a gentleman closely engaged in the city, was 37 years of age, about 5 feet 7 inches in height, and 10 stone 2 lbs. in weight, of sallow complexion, but healthy aspect. He said he had enjoyed excellent health until the age of 29, when he had a severe attack of fever, which left him in shattered health and extremely nervous. Some months elapsed before he regained his strength and was able to resume business, and he had suffered ever since, on slight occasions, from disturbance of the digestive organs, as evidenced by flatulence after meals, palpitation, colicky pain in the abdomen, and a tendency to acidity and diarrhœa. Accompanying these symptoms there was a distressing sense of depression, a disinclination to exertion, and inability to apply himself steadily to work. He was always fearing some impending calamity, some serious and irremediable bodily affliction, or some loss or misadventure in business. His skin was cool and rather inactive; pulse 84. Tongue coated; bowels at one time costive, at another relaxed. The urine was frothy or firmly beaded, clear, acid, of pale sherry colour, sp. gr. 1028. It had a strong urinous smell, and was perfectly free from sugar and albumen. Nothing noteworthy was observed under the microscope; on the addition of nitric acid an intense effervescence ensued, and within half an hour crystals of nitrate of urea began to form and soon filled two thirds of that portion of the tube occupied by the urine. In this case as in the last, Dr. Dickinson kindly determined the amount of urea excreted in twenty-four hours by examining a sample taken from the entire quantity of urine (1359 c. c.) which had been passed, and he found that it amounted to 55·1 grammes, or 22·1 grammes in excess of the average. In four other cases, in which at my request, Dr. Dickinson determined the quantity excreted in twenty-four hours, it was found to amount to 42·5 grammes, 41·8 grammes, 39·06 grammes, and 51 grammes.

Now, all the instances which have come under my notice have had several features in common. With one exception, that of a lady, aged forty-three, the patients have all been males, varying in age from twenty-three to fifty-four. Most of them have been essentially meat eaters, partaking sparingly of bread and other varieties of farinaceous food, but five of them ate meat only twice daily, and one, a member of our own profession, declared, not only that he never touched meat except at dinner, but that even then the principal part of his meal consisted of vegetable and farinaceous food. Without exception, the patients have been tolerably healthy in appearance, and often somewhat florid, though in some instances they have lost flesh slightly; indeed, their aspect has been so little indicative of disease, and their complaint of suffering has been so urgent, that any practitioner who did not examine the urine for urea would have surely regarded them as simply hypochondriacal. Usually the pulse has been quick and rather weak, and the patient's complaint has been of languor, flatulence, restlessness at night, and extreme nervousness. They have been afraid of encountering the rubs of everyday life, and in some instances have for the time lost their pleasure in society; they have eaten fairly, though with less than their usual relish, and the feeling of languor which has oppressed them, and of fatigue

which has followed even a moderate amount of exertion, has led to their abstaining almost wholly from exercise. They have usually complained of extreme depression in the morning, with a sense of heat about the eyes, muzziness in the head, and weariness after breakfast—feelings which have in some measure passed off as the day has advanced, and they have partaken, as usual, of stimulants. The condition of the urine has varied; at one time it has been scanty, and loaded with lithates; at another abundant, or even excessive in quantity, of a light sherry colour and strong urinous odour; and these alterations have been repeatedly observed in the same case at intervals of a few days, or even of a few hours. The pale and clear urine, of specific gravity varying from 1029 to 1032, and quantity from 32 oz. to 64 oz., is that which has usually contained the largest quantity of urea, and it has remained markedly frothy or beaded for twenty-four or thirty-six hours, just like diabetic or highly albuminous urine. Dr. Prout has stated that "urine containing a large proportion of urea is prone to decomposition, and generally soon becomes alkaline;" but in the cases under consideration the urine, even when exposed to the air, will remain acid and free from decomposition for two or three weeks in warm weather, and in cold weather will remain unchanged for as many months.

The method I have adopted in testing the urine has been to add to a small quanity of it in a test-tube about one-third of its bulk of nitric acid, and then to shake the tube until all effervescence has subsided. The tube is then left at rest, to allow of crystallization of nitrate of urea to take place. In cold weather this is commonly effected in twenty minutes or half an hour, and it will usually occur in about the same time even in hot weather if the test-tube is immersed in a bath of cold water.

It should, perhaps, be added that the tendency to a recurrence of this form of disease is very great, and several of the patients have consulted me in reference to the same train of symptoms on more than one occasion.

The treatment adopted has varied in its details, but that which has proved most successful is based upon the view which I take of the pathology of the disease, namely, that it is connected primarily with perverted nervous action, in consequence of disturbed assimilation. Neurine tonics, such as arsenic, quinine, strychnia, iron and zinc, together with the mineral acids, the shower bath, and the dripping sheet, are the remedies which have proved most successful in my hands, and when combined with alterative doses of blue pill and colchium will usually afford relief. In one or two instances, characterised by extreme irritability, the bromide of potassium, in conjunction with iron, has proved a more effective remedy, and occasionally the hypophosphite of soda has been serviceable.

The form of the disease which I have thus endeavoured to bring before the Society has not as yet received distinct recognition, though the peculiarity of the symptoms by which it is signalised are such, I think, as entitle it to be regarded as a special form of derangement. Except in Dr. Prout's classical work on 'Stomach and Urinary Diseases,' I find no mention made of it in any treatise on the urine published in this country. Even Dr. Prout regards it as very rare, and, while suggesting its close connection with diabetes mellitus, declares (p. 96) that "where he has seen one case of an excess of urea in adults he has seen twenty cases of diabetes. Dr. Parkes, referring to Dr. Prout's observations on these cases of azoturia, distinctly states, "I have never seen a disease of this kind." It is obvious, therefore, not only that this condition of the urine has, in many instances, escaped recognition, but that the form of derangement on which it depends requires careful investigation.

The symptoms by which it is characterised appear to me to necessitate a complete revision of the theory hitherto accepted respecting the cause of the presence of urea in the urine. Up to the present time it has been held that urea is formed principally, if not solely, during the destructive processes of assimilation as a result of oxidation of the tissues, and in confirmation of this opinion most authors have asserted that it is found in largest quantities after violent exercise and during the excitement of febrile disorders, when

the waste of tissue is at its maximum. But I altogether doubt this statement, and certainly in the class of cases now brought before the Society this condition of affairs is reversed. The patients ordinarily remain in fair bodily condition, lose very little flesh, and bear the aspect of health; they are languid and lethargic while the attack is present, and take little exercise; their appetite is good, though their zest for food is impaired; and their principal complaint is of dyspepsia, prostration, and nervous derangement, so that they are often regarded as simply nervous and hypochondriacal. In short, it would appear that the azoturia must have some other source than the wear and tear of the tissues, and there are only two probable explanations of its occurrence—the one that it is referable, in part at least, to the production of urea from the elements of the food during the primary processes of assimilation, as a consequence of perverted nervous action; the other that a larger quantity than usual of the nitrogenous elements are secreted by the kidneys in consequence of a defective secretion of nitrogenous matter by the bowel. The recent experiments recorded by Dr. Parkes would seem to show that this latter is at least a possible explanation, and unless, in any given case, the urine and the excreta from the bowels could both be examined, it cannot be affirmed positively that it does not afford a solution of the mystery. But it appears far more feasible to suppose that a certain portion of the food, instead of being utilised in the system, undergoes conversion into urea, and is then excreted without having fulfilled its mission in the animal economy. In the class of cases under consideration, the bowels are not more than ordinarily torpid, nor is there any evidence of defective intestinal secretion, whereas there are marked symptoms throughout of disturbed digestion and of perverted nervous action.

Several circumstances lead me to believe that this affection is more nearly allied to gout than it is to diabetes, as suggested by Dr. Prout. In the first place, not a trace of sugar was detected in the urine in any instance, though it was invariably sought for. Secondly, no less than eleven out of the twenty-seven patients were the offspring of gouty parents, and three of them had actually suffered from gout. Thirdly, the urine was often highly charged with lithates, and occasionally threw down crystals of uric acid, indicating a strong tendency to the lithic acid diathesis. Fourthly, in most instances the quantity of urea appeared to vary inversely as the quantity of uric acid. I speak hesitatingly on this point, because, unfortunately the amount of uric acid, in each specimen of urine was not determined by analysis; but when the urine proved, as it usually did, clear and often pale at one time, and high coloured and loaded with lithates at another, the urea was invariably found to exist in largest quantities, as shown by the crystallization of nitrate of urea in those specimens of urine which were free from lithates, although the quantity of urine voided on those occasions was larger than when the lithates were deposited. If, on further examination, a direct relationship should prove to exist between the quantity of urea and uric acid excreted in these cases, another link would be added to the chain of events which appear to exercise a bearing on the causation of gout. At present my information on the subject is too imperfect to warrant such a conclusion, but I have deemed it expedient to draw attention to the facts as far as I have hitherto ascertained them.—*Medico-Chirurgical Transactions*, *Vol.* 51, 1868, *p.* 45.

37.—ON THE ALLEGED EFFICACY OF THE PEROXIDE OF HYDROGEN AND OZONIC ETHER AS REMEDIAL AGENTS IN DIABETES MELLITUS.

By Dr. F. W. Pavy, F. R. S., Assistant-Physician to, and Lecturer on Physiology at, Guy's Hospital.

[Dr. Pavy furnishes the following paper in answer to many enquiries which have been made of him as to his experience of the action of peroxide of hydrogen in diabetes.]

Amongst the various remedies that have from time to time been proposed,

upon theoretical grounds, for diabetes, oxidising agents hold a prominent position. It has been a favourite idea to regard this disease as arising from a defective oxidation of sugar in the system. Bernard even admits that at one period he was inclined to look upon the artificial diabetes arising from his operation of puncturing the floor of the fourth ventricle as due to a disturbance of respiration leading to an imperfect combustion of sugar in the system. He continues by stating. however, that he was obliged to abandon this theory in the presence of new facts with which it did not accord; and afterwards asserts that it is not by combustion that sugar disappears in the system.

As oxidising agents, the permanganate and perchlorate of potash have been, in their turn, proposed; and more recently, attention has been bestowed upon the peroxide of hydrogen and ozonic ether. A case reported by Dr. Day of Geelong. in the pages of the Lancet for January 11th, 1868. brought these latter agents into prominent notice, and led to high expectations being entertained regarding their efficacy. Dr. Day, after dieting a patient suffering from diabetes, and trying the various medicinal remedies recommended for the complaint, without effect, began to reflect in the following manner upon his case. "While pondering," he says, "over the hopeless condition of my patient it occurred to me that if I could oxidise the sugar that had been taken up in the general circulation, it would be an approach toward the natural mode of its elimination by the lungs. With this object in view, I gave half-drachm doses of the ethereal solution of peroxide of hydrogen, mixed in an ounce of distilled water, three times a day." From the report that follows, an astonishing improvement took place in the state of the patient; and in seventeen days, in the place of an extreme state of distress, we find her condition stated to be as follows: "Says she feels as well as ever she did; never felt better in her life."

Looking at this case as it stands, nothing could be more satisfactory than the result depicted: and I am sorry, for the sake of therapeutics and those suffering from diabetes, that my own experience does not substantiate the conclusion that might be drawn from it. I have tried both the aqueous and ethereal solutions of peroxide of hydrogen in the complaint, but have not been able to perceive that the slightest benefit has been produced.

A few weeks after the report of Dr. Day's case appeared, I tried the aqueous solution of peroxide of hydrogen in several cases, and closely watched, with the assistance of the students of Guy's Hospital, the results. The agent was obtained from Mr. Robbins, of Oxford street, and administered in two drachm doses three times a day. There was not the slightest effect traceable upon the quantity of urine, quantity of sugar passed, or the symptoms of the patient. One patient, indeed, expressed himself rather indignantly upon having what he conceived to be only water administered to him.

I have since tried the ethereal solution of peroxide of hydrogen, or, as it is called ozonic ether; and will furnish the details of a case in which I have recently employed it in Guy's Hospital, and in which a daily analytical examination of the urine was made.

The patient, a man aged 29, had been the subject of diabetes, without any complicating affection, for a period of nearly a year. Upon admission into the hospital, he was placed upon a restricted diet, the food allowed consisting of meat, bran biscuits, eggs, greens, and beef-tea, with three ounces of brandy a day. An astringent mixture had recently been ordered, to check diarrhœa, from which he was temporarily suffering. For five days before the ozonic ether was commenced, the state of his urine was as follows:—

Date.	Quantity of urine per 24 hrs. in oz.	Sp. gr.	Quantity of sugar per fluid ounce in grs.	Quantity of sugar per 24 hrs. in grs.
Dec. 16th	 100	 1033	.... 26½	 2650
17th	 110	 1036	.... 28¾	 3162
18th	 100	 1037	.... 24¾	 2475
19th	 95	 1031	.... 19½	 1852
20th	 100	 1039	 30	 3000

Ozonic ether was now administered in half-drachm doses with water four times a day, and without any other medicinal agent. No alteration was made in the diet. The diarrhœa under which the patient had been formerly labouring, had previously disappeared. The ozonic ether was continued for nearly three weeks; and the following is an account of the state of the urine during the time :—

Date.	Quantity of urine per 24 hrs. in oz.	Sp. gr.	Quantity of sugar per fluid ounce in grs.	Quantity of sugar per 24 hrs. in grs.
Dec. 21st	90	1039	31¼	2212
22nd	100	1038	22½	2250
23rd	100	1035	24	2400
24th	110	1033	19¾	2172
25th	110	1025	20	2200
26th	100	1029	24	2400
27th	110	1030	25⅛	2882
28th	115	1030	22½	2587
29th	120	1034	19	2280
30th	115	1032	20½	2357
31st	110	1039	28¾	3162
Jan. 1st	120	1030	25¾	3090
2nd	120	1031	19½	2870
3rd	110	1033	21¼	2337
4th	110	1037	32¾	3602
5th	120	1034	27½	3330
6th	110	1035	31¼	3437
7th	110	1037	37½	3052
8th	120	1037	32½	3930

It will be seen from the above report that there was no marked effect either one way or the other observable upon the urine. What slight effect there was, was the reverse of improvement, the urine being higher in quantity, and the sugar larger in amount, towards the end of the period during which the ozonic ether was administered than at the commencement. The patient, as regards his general feelings, expressed himself as not perceiving much difference; if anything, he thought that he had been feeling a little more thirsty, and that his appetite was not so good.

I have come across several cases in private practice in which the ozonic ether has been tried. In none have I been able to learn that any benefit was produced. Indeed the fact of the patients coming to me may be take as affording evidence that the result was not satisfactory. One patient whom I have recently been attending was glad that I proposed making known my experience, as he had been worried on all sides by this friend and that to try the new remedy for diabetes, as it was called. He took it for two months, and in speaking about it expressed himself in anything but friendly terms towards it. He had lost his appetite, he said, under its use, and I had to listen to a category of other evils that he was sure had been produced by it.—*Lancet, March* 13, 1869, *p.* 358.

38.—CASE OF DIABETES TREATED WITH THE PEROXIDE OF HYDROGEN.

By Dr. W. H. Day, Physician to the Samaritan Free Hospital, and to the Infirmary for Consumption and Diseases of the Chest, Margaret Street.

One or two successful cases are not enough to warrant judgement of the merits of any drug; we must have case after case yield which has obstinately resisted other therapeutic measures before we can pronounce of its worth. If a remedy can be found to control the excessive loss of fluid which is going on in diabetes, and to improve the general condition of the system, we may hope with a careful diet and regimen, to prolong life for many years in comfort, if not to cure the disease itself. The case of the late Dr. Camplin is a

very remarkable one of what may be done with care and judicious management. The specific gravity of his urine, which at one time was as high as 1040, fell to 1016, and without a trace of sugar; but the improvement was more from the diet than from any medicine. The good that has been achieved in the present case must be due to the medicine employed rather than to the diet, which has not been carefully observed. The patient has throughout eaten moderately of ordinary bread, and violated the rules laid down by drinking porter frequently. In other respects his diet has consisted chiefly of eggs, fish, and meat.

J. H., aged 57, by occupation a messenger, experienced good health till April, 1868, when he became very weak and languid, lost flesh, and had no appetite. He was told by a medical man that his kidneys were sound, although at this period he passed an excessive quantity of urine. For many years he was addicted to drinking a great deal of beer, but lately he has reformed. In November, 1868, when I saw him for the first time, he was too feeble to walk across the room, and was very worn and emaciated; indeed he could not support himself in an upright posture. He was afraid to eat, from the extreme flatulence and inability to digest food. The action of the heart was very feeble. The liver much exceeded its natural limits, and there was considerable fluid in the peritoneal cavity. The superficial veins of the abdomen were enlarged. The legs were very anasarcous, shining and pitting on pressure, and there were dark ecchymosed spots which threatened to burst. I prescribed the nitro-muriatic acid with taraxacum and gentian, and ordered him to drink a little brandy-and-water. Two days later the specific gravity of his urine was found to be as high as 1045, and to assume the deepest brown colour on boiling with liquor potassæ. During the day and night he passed between ten and twelve pints of very faint straw-coloured urine. As the acid mixture seemed to suit, I told him to continue it, and ordered in addition, two drops of creasote in the form of a pill three times a day. He also took dilute phosphoric acid with glycerine in barley-water for an occasional drink, although his thirst was less than I have observed in a case of diabetes. There was another unusual feature in this case: the bowels were almost always moved regularly every day without aid from med cine.

On the 24th of December, as he was not making any satisfactory progres I determined to give him the ethereal solution of peroxide of hydrogen in half-drachm doses three times a day, in an ounce of water, omitting all other medicine. Three days later the dose was increased to one drachm. A remarkable change for the better at once set in; the urine was reduced in quantity, and the appetite and strength improved.

Urine passed in twenty-four hours:—

1868	...	Nov. 12th	...	11 pints	...	Sp. gr.	1045
1869	...	Jan. 26th	...	7½ "	..	"	1030
"	...	Feb. 1st	...	6½ "	...	"	1032
"	...	" 24th	...	5 "	...	"	1024

March 3d. He has increased fifteen pounds in weight, and looks altogether another person. His liver is greatly reduced in size, and the abdominal veins are much less prominently marked. No fluid can be detected in the cavity of the abdomen, and the amount of tympanitis is only slight. There is scarcely a trace of œdema in the legs. Dr. Savage, who requested me to look after this patient, concurs with me in attributing the improvement to the employment of the peroxide of hydrogen.—*Lancet, March* 20, 1869, *p.* 396.

39.—REMARKS ON THE TREATMENT OF DIABETES BY OZONIC ETHER.

By A. E. Wilmot, Esq. Bridlington, Yorkshire.

[Mr. Wilmot has had the opportunity of testing the effects of ozonic ether in three cases of diabetes. These cases were attended along with Dr. Hutchinson, of Bridlington.]

Its administration in each case was attended with most satisfactory results, and the patients expressed themselves relieved from the most distressing symptoms. In the first place, it has a most powerful influence upon the cutaneous, nervous, and vascular system, imparting a glow of warmth to the surface of the body, and stimulating the glandular element of the skin. Secondly, it assuages the painful feeling of constant thirst, in some cases more than others, but in all in a marked degree. Thirdly, it allays restlessness, no doubt from the anæsthetic effect of the ether. Fourthly, it diminishes considerably the quantity of urine voided—in fact, in two out of the three cases, reduced it to the normal amount. The first case (that of a stout elderly lady who was passing seven pints of characteristic secretion in the twenty-four hours) is now apparently quite well; the saccharine matter has disappeared, and the water is normal in quantity. The second case is that of a tradesman who was becoming rapidly emaciated, and passing on an average seven pints and a half of highly saccharated urine in the twenty-four hours—the quantity is now reduced to three pints. The progress of emaciation seems checked. This patient had occasion to leave home for a time, and ceased taking the ether; his symptoms soon became augmented. The third case, that of diabetes in a lady, is complicated with advanced disease of one kidney; but even with that disadvantage, added to its chronicity, the quantity of renal secretion has been brought down from about four quarts to three pints and a half in the twenty-four hours, although it varies in amount. This patient, on coming under treatment, was too weak to hope for much improvement; but her condition, otherwise distressing, is now converted into one of comparative comfort. Fifthly, the elimination of sugar by the kidneys is lessened, probably either by the ozonic ether controlling the excessive elaboration of that material in the liver, or by influencing the hepatic portion of the organic system of nerves, and enabling it to resume its normal function of determining the formation of glycogen by the hepatic cells, thereby converting saccharine elements into an oxidisable substance which becomes resolved into carbonic acid and water, and, in that condition is constantly cast off by the depurating organs of the body.—*Med. Times and Gazette Dec.* 12, 1868, *p.* 680.

40.—THE THERAPEUTIC VALUE OF BELLADONNA IN REFERENCE TO DISEASES OF THE BLADDER AND URETHRA.

By Reginald Harrison, Esq., Assistant Surgeon to the Royal Infirmary, Liverpool, and Lecturer on Anatomy at the School of Medicine.

I propose briefly to allude to some advantages I have observed to follow the use of belladonna, local and general, in certain disorders of the genito-urinary system.

As a topical application I have used it with benefit in some of the more obstinate forms of stricture, especially those consequent on injuries of the urethra.

Referring back, we find some of the surgeons of the last century strongly recommending it where spasm was present, to produce relaxation; but as we are now provided with remedies more certain in their action for combating this complication, this drug has naturally fallen into disuse.

It is not, however, in reference to any antispasmodic influence it may possess, that I purpose to allude, but to the power which I believe it has of directly influencing and effecting a change in the obstructing materials. I was first induced to give it a trial in these cases by observing the benefit that followed its application to cicatrices, and growths of a fibrous character resembling them; in one instance especially, an unsightly deformity on a young woman's forehead, the constant application of the extract of belladonna produced a very decided effect; the cicatrice, though not disappearing, became much softer, more like the healthy skin around it, but what was of still more importance, it lost almost entirely the tendency to contraction which is so productive of such painful deformities. I have used it with undoubted advantage in other cases, and I therefore had reason for anticipating an equal bene-

from its application to such internal cicatrices as give rise to inconvenience. Of these, the most distressing and obstinate is the stricture following injury to the urethra. It may be dilated, very often, readily, but soon returns, unless constantly under supervision. Dilatation simply *stretches* the cicatrix, without in any way depriving it of that contractile power which is the essence of the disorder.

Some patients may be instructed how to introduce an instrument for themselves, but such a course, for obvious reasons, is not of universal application. Others may be permanently relieved by proceedings of a more strictly operative character, and with comparatively little danger; but from these we find they sometimes shrink. It is to meet such cases that I would suggest the use of belladonna.

The most convenient way of applying it is with the Oleum Theobromæ of the Pharmacopœia, which is sufficiently hard at ordinary temperatures to permit of its ready introduction into the urethra. I generally recommend two grains of the extract of belladonna to be used in this way twice a day, in conjunction with the regular introduction of the metallic bougie in gradually increasing sizes; the belladonna should be persevered in for some time after the bougies have been discontinued.

Very great and, I believe, permanent benefit has resulted from this plan of proceeding, and in cases where the bougie treatment *alone* had previously only effected but very temporary relief. I may also add that my observation is confirmed by others, who have given this plan a trial.

Administered internally, belladonna is one of the most valuable anodynes we possess, and it appears to me to be specially applicable to disorders of the urinary system. In reference to its alkaloid atropine, Dr. Anstie remarks, in the first number of the Practitioner, "that it is incomparably the best of all medicinal remedies for every kind of pain in the pelvic viscera. Nothing can approach it in this respect."

The rapidity with which the alkaloid atropia is eliminated from the system is very remarkable. Dr. John Harley, in his Gulstonian Lectures, mentions that he had "repeatedly demonstrated the presence of atropia in the urines of different individuals, eighteen, nineteen and twenty minutes after the subcutaneous injection of the forty-eighth and even the ninety-sixth of a grain of sulphate of atropia."

In addition to the general narcotic effects exercised by the drug, the actual presence of the alkaloid in the urine may further explain the benefit following its administration in urinary affections.

The inconveniences attending the use of belladonna are slight, compared with those of opium and other narcotics; the appetite is not interfered with, and, beyond sometimes a little temporary dimness of vision, no cerebral unpleasantness is experienced.

The cases in which the remedy is generally applicable are those which may be classified under the generic term of "irritable bladder." Its use may be advantageously continued, in conjunction with other expedients, for the removal of any exciting causes that may be present, such as the dilatation of strictures, removal of calculi, and other sources of irritation.

There is a form of irritation not unfrequently observed, both in males and females, more especially the latter, where there is great irritability, accompanied with the deposition in the urine of large quantities of epithelium. The symptoms sometimes resemble those of calculous disorders, but on introducing a sound, a roughened condition of the lining membrane is alone detected. These almost invariably do well under the influence of belladonna. The nocturnal incontinence observed in delicate children, in nearly all cases the results of a simply irritable bladder and nervous system, do well with small doses of atropine combined with general hygienic measures.

In reference to the mode of administration, I have little to add. I generally prescribe the extract of belladonna in grain doses, once or twice a day, in the form of pills; or the solution of atropine, 1-80 of a grain to 1-60, very gradually increased, until a slight degree of atropism—dryness of the throat, or dimness of vision—is produced.—*Liverpool Medical and Surgical Reports, Oct.* 1868, *p.* 186.

SURGERY.

BONES, JOINTS, ETC.—AMPUTATIONS, FRACTURES, DISLOCATIONS.

41.—ON LIGATURE OF ARTERIES ON THE ANTISEPTIC SYSTEM.

By Joseph Lister, Esq., F.R.S., Professor of Surgery in the University of Glasgow.

[The danger of secondary hemorrhage, when the ordinary ligature is used, arises from putrefaction, whereby the tissue of the vessel is softened and rendered friable.]

The Antiseptic System places this branch of surgery, like most others, in a new light. One point which it has brought out in striking relief is that a portion of dead tissue is not necessarily thrown off by suppuration, but, unless altered by putrefaction or artificially imbued with stimulating salts, serves as pabulum for the surrounding living parts, which remove it by a sure process of absorption. Hence the death of a portion of the external coat included in the ligature does not of itself render it a cause of suppuration. And I conceived that if a silk thread, steeped in some liquid capable of destroying the septic organisms in its interstices, were tied round an artery, and left with short-cut ends in a wound dressed antiseptically, the foreign body, soon losing, by diffusion into the circulation, the stimulating salt with which it was saturated at the outset, and being in its own substance as unstimulating chemically as a pellet of lead from a fowling-piece, would either remain, like the latter, permanently encapsuled, or itself experience absorption together with the dead tissue in its grasp. In either case, being destitute of irritating properties, it should leave the primitive strength of the arterial coats unimpaired; when the objection to tying near a large branch would cease to exist. The wound meanwhile would, under proper management, close rapidly, without any deep-seated suppuration, and would be efficiently protected against the evil influences of impure atmosphere. In short, the ligature of an arterial trunk in its continuity would be brought to a state of perfection.

I have subjected these theoretical views to the test of experience, and though the results have not turned out in all respects exactly as I had anticipated, yet those finally arrived at appearing satisfactory, I now present to the readers of the Lancet an account of all that I have done in the subject.

Case of ligature of the carotid artery in the horse with silk thread, on the antiseptic system.—On the 12th of December, 1867, I tied the left carotid artery of a horse in the middle of the neck with a piece of "purse silk" saturated with a strong watery solution of carbolic acid, cutting the ends short and dressing the wound antiseptically. Healing took place without any suppuration, and with remarkable absence of swelling or tenderness. Nearly six weeks after the operation I investigated the parts. On laying open the vessel, I found at the cardiac side of the ligature a firm adherent clot an inch and a quarter long; but at the distal side coagulation had been entirely prevented by the reflux current of blood through a branch about as large as the human vertebral, which took origin as close to the ligature as was possible. Under such circumstances secondary hemorrhage would necessarily have occurred had the thread been applied in the usual way. Here, however, the artery appeared as strong at the part tied as elsewhere. The cul de sac showed indeed some irregularity, in consequence of the puckering of the internal and middle coats; but the surface appeared completely cicatrised, and presented

the same character as the natural lining membrane of the vessel; and the ligature, which seemed as yet unaltered, was found lying dry in a bed of firm tissue; that within the noose being apparently a new formation in place of the portion of external coat killed by the tightly tied thread; while, externally, the constriction necessarily caused in the first instance by the operation had been filled in by a similar compact structure.

Thus far experience had proved precisely in accordance with my expectations, so that I felt justified in carrying a similar practice into human surgery.

Case of ligature of the external iliac artery with silk thread, on the antiseptic system.—On the 29th of January, 1688, I tied the left external iliac artery in a lady, fifty-one years of age, on account of an aneurism of the upper part of the femoral, as big as a large orange, and reaching somewhat above Poupart's ligament. I was informed that it had existed for four years, growing more rapidly of late, and causing severe agony, which had made her keep entirely to bed for the last few weeks, and had deprived her of her appetite, and reduced her strength. A silk thread was applied, as in the last case, except that it had been steeped for two hours in undiluted liquid carbolic acid instead of the watery solution, to make sure of the destruction of all septic organisms lodged in its interstices. The wound, being dressed antiseptically, became superficial without suppuration, the patient meanwhile experiencing no febrile disturbance, her appetite returning as soon as the sickness from chloroform subsided. On the fourteenth day she sat bolt upright in bed without inconvenience. Four weeks after the operation, the superficial sore being completely cicatrised, she was allowed to walk about her room; and just six weeks from the date of the application of the ligature she went down three flights of stairs and walked for some time in the streets, and then up again to her room without over-fatigue. The aneurism was free from pulsation, and much reduced in size.

She continued for about ten months in fair health and strength; but, in the latter part of November, became affected with a peculiar spasmodic disorder of the respiration, and on the morning of the 30th of the month, while sitting up in bed, she suddenly exclaimed that something had given way within her, and that she was dying, and then immediately expired. Next day I made a post mortem examination, when the idea which she had expressed proved correct,—an aneurism of the descending part of the aorta having given way, and discharged an enormous quantity of blood into the mediastinal and subpleural cellular tissue. The parts concerned in the operation having been removed and dissected, the following appearances were disclosed:—The aneurism was not entirely obliterated; but remained about the size of a cherry or a large filbert, of somewhat fusiform shape. The upper two-thirds were solid, being occupied by firm coagulum incorporated with the sac. The lower third, situated just at the bifurcation of the common femoral, had been kept free from coagulation by the regurgitant stream of blood from the profunda into the superficial trunk. This part of the sac appeared constituted by the wall of the vessel, very slightly distended. The external iliac artery was considerably shrunk throughout, and tapered from each end to near the middle, where it was only about a twentieth of an inch in diameter. In the greater part of its length the structure of the dwindled vessel could be distinctly recognised, with adherent coagula in the interior, decolorised and otherwise altered. But at the narrowest part the artery was reduced to mere fibrous tissue, constituting a dense white band five-eighths of an inch long, from the middle of which was seen projecting at one side a round, buff-coloured appendage about a line in diameter, somewhat obscured by a trifling amount of inflammatory condensation of texture in the immediate vicinity. On scratching this little body with the point of a knife, I found it to be a very thin-walled capsule, containing the knot of the ligature, with two tapering ends, which were shorter than the thread was cut at the operation, while the noose had vanished altogether. The surface of the knot also showed clear indications of having been subjected to an eroding agency, similar, no doubt, to that exerted by granulations upon dead

bone absorbed by them. Besides the remnant of the ligature, the tiny capsule contained a minute quantity of yellowish, semi-fluid material, looking to the naked eye like very thick pus. Under the microscope, however, pus-corpuscles were seen to form but a small proportion of its constituents, which were principally rounded corpuscles of smaller size, and fibro-plastic corpuscles, together with some imperfect fibres and granular material. In addition to these elements were some which at first puzzled me; but which turned out to be fragments of silk fibre, of various lengths, and of jagged, tapering, or otherwise irregular forms, and many of them greatly reduced in thickness, contrasting strongly with the uniform bands of a fresh piece of silk from the same reel that had furnished the ligature.

Mingled with the puriform fluid were also some delicate filaments of silk, visible without the microscope; and these seemed to retain their natural elasticity. Nor was there anything about the more minute pieces into which the fibres had been so finely chopped up, to indicate that they were undergoing a process of solution or softening by the fluid that soaked the thread. They had rather the appearance of having been superficially nibbled so to speak; confirming the impression conveyed by the naked-eye characters of the knot, that the silk had been eroded by the absorbing action of the surrounding parts. Indeed, considering the organic origin of silk, the remarkable thing seems to be, not that it should be absorbed by the living tissues, but that it should resist their influence so long.

Why it was that the parts in immediate contact with the silk should have assumed so imperfect a structure is a difficult question, but one of great interest: because, although that structure could not be called pus, it was certainly a very near approach to it; and it is impossible to say that we had not here an incipient abscess. There could be no doubt that the presence of the thread was in some way or other the cause, and I think we can hardly be wrong in assuming that, in order to give rise to such degeneration of tissue, it must have operated as a persistent, if trifling, source of abnormal stimulation. Now, as putrefaction is here out of the question, and as the substance of silk is not chemically stimulating, we seem shut up to the conclusion that the thread must have occasioned disturbance of a mechanical nature. Further, the effect in question seems to be essentially connected with the disintegration of the silk. For in the horse's carotid the silk ligature, having remained unaltered during the six weeks that had passed after the operation, was found surrounded on all sides by compact tissue; and in the present case, so long a period as ten months having elapsed before the puriform condition was observed in an apparently incipient stage, it is probable that the thread had lain for a long time inert, producing irritation only when partially absorbed. If then we inquire how disintegrating silk could prove a source of mechanical irritation, it seems not improbable that it may have been from the sharp and jagged fragments of the fibre perpetually fretting the elements of the living tissue around them. This view, if correct, would explain the curious fact observed by Lawrence and others, that when fine silk ligatures had been left with short-cut ends in a stump, though the wound might heal without their separation in the first instance, they were liable to make their appearance subsequently, sometimes at so late a period as seems to exclude the idea of putrefaction having occurred from organisms introduced in the threads. Indeed such ligatures occasionally showed themselves encapsuled in little nodules in the cicatrix, without suppuration occurring at all. In other words, the apparently soft silk, instead of remaining like a smooth leaden pellet permanently imbedded in the place where it was first introduced, made its way to the surface, with or without suppuration, like a sharp spiculum of rigid glass; the silk being in its minute structure comparable to the lead when in the primitive condition of smooth continuous fibres, and to the glass spicula when in the form of jagged fragments as the result of partial absorption.

But whatever may be thought of this explanation, it is clear that if there is any chance of silk, though used antiseptically, giving rise, even in exceptional cases, to abscess in the vicinity of an artery tied with it, this is a

serious objection to its employment; and as the near approach to suppuration in the present instance was undoubtedly occasioned by the persistent presence of the thread, the case, while interesting as affording evidence that silk is susceptible of absorption, suggests the expediency of substituting for that material some other substance which can be more readily taken up by the tissues.

The use of "animal ligatures," of cat-gut leather, or tendon, was long since tried and abandoned as unsatisfactory; but after the experience which the antiseptic system has afforded of the disappearance, without suppuration, of large dead pieces of skin and other textures, there could be little doubt that threads of animal tissue, if applied antiseptically, would be similarly disposed of.

And even if chemical processes should have been used in preparing such threads, it did not seem likely that this would interfere with their absorption; for I knew that the free action of carbolic acid on blood and sloughs had no such deterring influence, and I have long been satisfied that the injection of a strong solution of perchloride of iron or tannic acid for the cure of nævi produces subcutaneous sloughs, which are imbued with the ingredients injected, and yet disappear, as a rule, without the formation of pus.

In order to put the antiseptic animal ligature fairly to the test, I made the following experiment:—

Ligature of the carotid artery in the calf on the antiseptic system, with threads composed of animal tissue.—On the 31st of Dec., 1868, I tied the right carotid artery about the middle of the neck in a healthy calf a few days old, the animal being under chloroform. Ligatures of two different kinds were employed, at an interval of about an inch and a half, the sheath of the vessel being left undisturbed in the intervening part. The cardiac ligature was of home manufacture, composed of three strips of peritoneum from the small intestine of an ox, firmly twisted together into a three-fold cord. The distal thread was of fine catgut, called "minikin gut" by the London makers. Both had been soaked for four hours in a saturated watery solution of carbolic acid, which swelled and softened them, so that the thread of my own making was too large to enter the eye of the aneurism needle except near the ends, where it was thinner than elsewhere. This substantial ligature bore the strain of tying well, but the fine catgut broke as I tightened the noose. I did not, however, remove it, but, having a second piece at my disposal, passed it round at the same place, and with gentle traction completed the knot. There were thus two ligatures of the gut at the distal side. All were cut short, except one end of the catgut, which I purposely left about three-quarters of an inch long, to give a better opportunity of ascertaining what would become of the foreign material. The antiseptic arrangements were as follows:—Before the operation the hair of the part was cut short, and a solution of carbolic acid in four parts of linseed oil (preferred for its cheapness) was rubbed well into the skin, to destroy any putrefactive organisms lying amongst the roots of the hairs, for any so situated might escape the action of the external antiseptic dressing, and communicate putrefaction to the discharges, and thence to the interior of the wound. The sponges used in the operation were wrung out of a watery solution of the acid (1 to 40), and all instruments introduced into the wound, together with the fingers of my left hand and the copper wire used for sutures, were treated with the same lotion, some of which was poured into the wound after the introduction of the last stitch, at one of the intervals left for the escape of discharge, to make sure against the chance of any fresh blood which had oozed out during the process of stitching having regurgitated and taken living germs in with it. The external dressing was a towel saturated with the oily solution, folded as broad as the length of the neck, round which it was wrapped so as to extend freely beyond the wound in all directions, prevented from slipping backward and forward by being stitched to a halter round the head, and to a girth behind the forelegs, while the bandage rolled round it kept it applied accurately to the surface. A sheet of gutta-percha tissue, to prevent contamination of the antiseptic towel from without,

and another roller, completed the dressing; and a "cradle" was placed upon the neck to check lateral movements which might disturb it. I have described these particulars because I am more and more convinced of the necessity for scrupulous attention to details such as the germ theory dictates, in order to attain anything like uniformity of successful results.

A few ounces of the oily solution were poured daily over the towel for the first week, after which the dressings were left untouched for three days, and then entirely removed. The wound was found quite dry and free from tenderness, and the cloth showed only a superficial bloody stain. The stitches being taken out, a drop of pus escaped from the track of the suture next the head, but this was the only appearance of suppuration in the case from first to last, and on the separation of the scab, a few days later, a sound cicatrix was disclosed. A month (thirty days) after the operation the animal, which had continued in perfect health, was killed, and the soft parts of the neck below to the spine were removed for examination. On dissection I was struck with the entire absence of inflammatory thickening in the vicinity of the vessel, the cellular tissue being of perfectly normal softness and laxity. On exposing the artery itself, however, I was at first much disappointed to see the ligatures still there to all appearance as large as ever. But had I borne in mind what I had observed in some of my earlier cases of compound fracture treated antiseptically, I should have been prepared to find these threads present in appearance, though absent in reality. It may be well for me to quote from the account I have before given of one of these cases. It was a compound fracture of the leg, produced by direct violence, with a wound of considerable size, and a great deal of extravasation of blood into the limb. In accordance with the practice which I then followed, a piece of lint soaked with undiluted carbolic acid had been placed over the wound, and had formed with the blood a firm crust. "Nearly three weeks after the accident I was detaching a portion of the adherent crust from the surface of the vascular structure into which the extravasated blood beneath had been converted by the process of organisation, when I exposed a little spherical cavity about as big as a pea, containing brown serum, forming a sort of pocket in the living tissues, which when scraped with the edge of a knife, bled even at the very margin of the cavity. This appearance showed that the deeper portions of the crust itself had been converted into living tissue. For cavities formed during the process of aggregation, like those with clear liquid contents in a Gruyère cheese, occur in the grumous mass which results from the action of carbolic acid upon blood; and that which I had exposed had evidently been one of these, though its walls were now alive and vascular." Thus the dead, but nutritious mass, had served as a mould for the formation of new tissue, the growing elements of which had replaced the materials absorbed, so as to constitute a living solid of the same form.

Hence it might have been anticipated that the ligatures of peritoneum and catgut placed on the calf's carotid would, after the expiration of a month, be found transformed into bands of living tissue. Such was, in truth, the case, as was apparent on closer examination. They had, indeed, a deceptive resemblance to their former condition from the persistence in their substance of the impurities of the original materials, the dark adventitious particles being of mineral nature incapable of absorption, so that they had remained as a sort of tattooing of the new structure. Nevertheless a marked alteration in colour had taken place, especially in the distal ligature, where the dirty-grey of the softened catgut had changed to a dirty-pink tint. The two pieces of catgut which had been tied round the vessel at that part had become, as it were, fused together into a single fleshy band, inseparably blended with the external coat of the artery. The knots were nowhere discoverable, and the only indication of the end which had been left long at the time of the operation was the presence of a black speck here and there upon a delicate thread of cellular tissue in connection with the vessel. The cardiac ligature was in like manner continuous in structure with the arterial wall. The short cut ends had disappeared; but the massive knot was represented by a soft smooth lump, which appeared at first entirely homogene-

ous, except that it was speckled with dark particles, as before referred to. On section, however, I discovered in the interior of the mass, and lying close to the wall of the artery, a small residual portion of the original knot, of comparatively firm consistence, and with the three-fold twisted character of the cord plainly visible. It was quite distinct from the living tissue that surrounded it, so that it could be readily picked out from its bed with a pair of needles. A slender and irregular remnant of the noose was also found lying in a sort of tubular cavity, extending about half round the vessel.

Thus the process of organisation had no yet quite invaded the entire thickness of the foreign solid, and it was a happy circumstance that the cord had been so constructed that the distinction between the old structure and the new could be plainly recognised.

Ample as was the evidence afforded to the naked eye of the organisation of these ligatures, it was satisfactory to find it confirmed in the clearest manner by the microscope. A bit of the knot, having been teazed out with needles in a drop of water, presented, like a fresh piece of peritoneum, the wavy bundles of parallel fibres characteristic of perfectly developed fibrous tissue. Adhering to the surface of the remnant of the ligature was some soft opaque material, readily washed off with water, consisting of corpuscles of different forms, most of them caudate or fibro-plastic, but some spherical, though not resembling those of pus; and here and there fragments of the original peritoneal tissue, affected more or less with insteratitial cell-development. At a short distance from the remains of the old thread, the fleshy material which had been formed at its expense proved to be a most beautiful example of fibro-plastic structure, the coarse fibres which mainly constituted it being composed of very large elongated cells, often containing several nuclei, and presenting in their course branchings and thickenings of various forms. Here and there were some fibres more perfectly formed, and also cells of a more rudimentary character. Again, the band which had resulted from the organisation of the two fine threads of catgut, which, from the smallness of their bulk had no doubt vanished early, having had longer time to perfect its structure, was a comparatively well-developed form of fibrous tissue, consisting of coarse fibres, rather than of elongated cells, being thus intermediate between the merely fibro-plastic material of more recent growth and the completed texture of the original thread. For it is to be remarked that a piece of catgut exhibits under the microscope abundance of perfect fibrous tissue. A more favourable period for the investigation, with a view to establishing the nature of the change which ligatures of animal tissue experience under antiseptic management, could hardly have been selected.

Between the parts tied the calibre of the artery was occupied by adherent coagulum, which was for the most part decolorised, and exhibited under the microscope fibro-plastic cells of irregular forms. A similar clot was present between the distal ligature, and a small branch that arose about a quarter of an inch beyond it. But between the proximal ligature and the heart the formation of a coagulum had been entirely prevented by a large vessel taking origin immediately above the part tied, which had thus borne for a month the full brunt of the cardiac impulse. Yet the vessel, so far from showing any sign of giving way, as it would inevitably have done had it been tied in such a situation without antiseptic precautions, appeared to have derived additional strength from the operation. The encircling ring of new tissue incorporated with the arterial wall must have had a corroborative effect; and within its grasp the inner coats, which seemed to have been but imperfectly ruptured by the soft and substantial ligature, were considerably thickened, and had coalesced so as to form a strong cul de sac, the irregularities of which had been smoothed over by a little fibrinous deposit, which had assumed the characters of a firm fibrous tissue, and presented a free surface undistinguishable from that of the lining membrane of the artery.

At the situation of the distal ligature the structure of the vessel seemed entirely unaffected. The middle coat was seen in longitudinal section as a pink streak between two white lines, representing the external and internal tunics, neither thicker nor thinner than in neighbouring parts. The catgut

threads had been tied too gently to produce rupture of the internal and middle layers, and their presence and the constriction which they occasioned, whatever may have been their effect in the first instance, had left no permanent marks of disturbance; while the fleshy band that had replaced them, though in time it would doubtless have dwindled to an insignificant filament, was at least a temporary addition to the strength of the artery.

These appearances at the distal ligature are calculated to revive under a new aspect the old question whether it would not be better always to avoid rupture of the internal and middle coats, which could easily be done by using a pretty thick piece of catgut softened by steeping it in a watery solution of carbolic acid. In this way the wall of the vessel would be left from first to last entirely intact. This, however, is probably a matter of indifference. Indeed, judging from the condition of the artery at the cardiac ligature, the injury done to the vessel at the outset by tight tying seems to lead to changes which increase its power of resistance, which was certainly severely tested in the present instance.

It appears, then, that by applying a ligature of animal tissue antiseptically upon an artery, whether tightly or gently, we virtually surround it with a ring of living tissue, and strengthen the vessel where we obstruct it. The surgeon, therefore, may now tie an arterial trunk in its continuity close to a large branch secure alike against secondary hemorrhage and deep-seated suppuration,—provided always that he has so studied the principles of the antiseptic system, and so carefully considered the details of the mode of dressing best adapted to the particular case in hand, that he can feel certain of avoiding putrefaction in the wound. For my own part I should now, without hesitation, undertake ligature of the innominate, believing that it would prove a very safe procedure.

Catgut, manufactured from the small intestine of the sheep, may be had at a very low price, from the thickness of a horsehair upwards. In the dry state it is objectionable from its rigidity, and also from a tendency of the first half of the knot to slip before the second half is secured. Water renders it perfectly supple, and as little liable to slip as waxed silk. But if a watery solution of carbolic acid is used for the purpose of making it antiseptic, the protracted immersion requisite to ensure completeness of the effect makes the finer kinds too weak and the stouter too clumsy. The method which I have found to answer best is to keep the gut steeping in a solution of carbolic acid in five parts of olive oil, with a very small quantity of water diffused through it. A larger proportion of the acid would impair the tenacity of the thread. If a mere oily solution is employed, the gut remains rigid, the oil not entering at all into its substance. But a very small quantity of water, such as the acid enables the oil to dissolve, renders the gut supple without making it materially weaker or thicker. And, curiously enough, the presence of this small amount of water in the oily solution gradually brings about a change in the gut, indicated by a deep-brown colour; after which it may be placed in a watery solution for a long time without swelling, as a portion prepared in a simple oily solution does. This is a great convenience; for an oily solution is unpleasant to work with during an operation, and exposure to the air soon renders gut suppled with water rigid from drying. But when it has been treated in the way above recommended, it may be transferred to a watery solution at the commencement of an operation, and so kept supple without having its strength or thickness altered.

For tying an arterial trunk in its continuity, catgut as thick when dry as ordinary purse-silk, will be found best. But for ordinary wounds, where, if one ligature happens to break, another can be easily applied, much finer kinds may be employed, and are convenient from their smaller bulk. For every-day use, a small oil-tight capsule may be carried in the pocket-case, and this can be replenished from a larger stock as may be necessary. I have had a small silver bottle, with well-fitting screwed top, adapted to my caustic-case, and this contains two little rods of wood, with gut of two sizes wound upon them, with a few drops of the antiseptic oil; and now that

torsion has almost entirely superseded the ligature in ordinary wounds, this small supply will probably last me for months.—*Lancet, April* 3, 1869, *p.* 451.

42.—ON THE ANTISEPTIC SYSTEM OF TREATMENT IN SURGERY.

By Joseph Lister, Esq., F. R. S., Professor of Surgery in the University of Glasgow.

[In compound fracture, as a general rule, healing by scabbing should be aimed at, by leaving the deeper layers of the dressing used to form the scab, and applying the antiseptic externally. If the antiseptic is allowed to penetrate to the wound, it stimulates the tissues to granulation and suppuration.]

The advantages of healing by scabbing are so great that it is worth while to endeavor to attain them, and I have been long striving to improve the method of dressing, so as to get rid, if possible, of the attendant risk. A plan which has, in most cases, answered well when the putty has been used, is to make the permanent dressing of two or three layers of lint somewhat larger than the wound, wrung out of a pretty strong solution of carbolic acid in oil, say one of acid to four of oil, and covered with a piece of oiled calico or linen rag extending about an inch beyond the lint in every direction. Over this is applied a stratum of antiseptic putty, which is changed daily, or once in two days, according to the amount of discharge. The blood from the wound soaking into the lint is acted on by the carbolic acid, and changed into a firm substance which consolidates the deep dressings into a crust or scab, and this crust, while sufficiently thick over the wound to prevent the carbolic acid of the putty from penetrating to the raw surface, is so thin at its margins formed by the rag as to be there kept antiseptic through and through. Then, in changing the putty, the first thing seen on lifting up its edge is the thin margin of the calico; and even if this be accidentally raised a little, its antiseptic property prevents any mischief from resulting. The putty is spread on calico, and the calico is applied next to the deep dressing, to prevent adhesion, while the external surface of the putty is covered either with thin block tin or sheet lead, or, what more recently we found to answer quite as well, gutta percha tissue, which, though it permits carbolic acid to escape through it, is not objectionable on that account if the putty be sufficiently thick, while the gutta percha, like the metallic plate, prevents the putty from becoming dry and hard. The putty is made to overlap the permanent dressing well on all sides, and I may remark that, whether the impermeable antiseptic guard be composed of putty or not, it is of the utmost importance that it should extend freely beyond the source of the discharge in every direction, so that the putrescible fluid may have to flow for some distance beneath it before it reaches the atmosphere or any dressing containing active putrefactive organisms. The degree of overlapping of the crust by the external dressing must vary according to the amount of discharge which may be anticipated. When this is large, it should be to the extent of three or four inches. Failures have undoubtedly often occurred for want of attention to this essential point.

But though this method will, with proper care, generally succeed, it would be very desirable, if possible, to get rid of the trouble involved in it. At one time I hoped this might be done by means of the plaster above mentioned, by employing a layer of it instead of the calico as the upper part of the permanent dressing, so that the adhesiveness of the emplastrum might keep the whole deep dressing securely applied to the skin, except at limited spots where the discharge might ooze out; another layer of plaster being used instead of the putty, with calico moistened with a watery solution of the acid interposed to prevent adhesion of the two layers of plaster. My anticipations, however, have not been verified in this respect. For the plaster, though it answers extremely well for an external antiseptic guard, whether in compound fracture, incised wounds, or abscesses, has proved

unsuitable for the permanent dressing. The substance of the emplastrum becomes softened by the solution of carbolic acid used to moisten the calico, and permits it to enter beneath it and soak into the lint below, and stimulate the raw surface to granulate and suppurate, and this was what occurred in the case of displaced foot above mentioned. At the same time the lint is kept moist, instead of forming a dry crust, and hence it may gradually shift its place along with the plaster that covers it, involving the risk of leaving the wound insufficiently overlapped. if not exposed. I have experienced this inconvenience in two cases of compound fracture which have been treated in this way. One of these was an old lady, of 75, in whom the *os humeri* was severely comminuted just above the elbow-joint, with a considerable wound from which six loose fragments were extracted; the other, was a boy, 12 years old, whose right thigh was much contused as well as broken by machinery. These cases, indeed, have done well; osseous union having occurred as early as if the fractures had been simple ones. But in both of them the wounds healed by granulation instead of by scabbing.

With the view of getting over these difficulties I sought to obtain some kind of antiseptic cement, by which a portion of dressing might be glued down firmly upon the skin. Among other materials I tried shell-lac, and, in so doing, I accidentally hit upon a substance which appears preferable to the plaster for almost every purpose. I found that this resin could be mixed with carbolic acid in any amount by aid of heat, the result, when cooled, varying, according to the quantity of the acid, from brittleness to fluidity, the intermediate proportions giving a firm but flexible solid with a certain degree of elasticity, approaching to some extent the characters of caoutchouc. It further turned out that the lac thus associated with the carbolic acid retained it with great tenacity,* so that a thin layer spread on calico may be used to store up a large quantity of the antiseptic, forming an application which retains its virtues for days at the temperature of the body, and at the same time, fails to irritate the skin. It has also this great advantage over the lead plaster, that it cannot be softened by either a watery or oily fluid. The only imperfection which it appeared to shew, when used in practice as an external antiseptic guard, was that when long applied to the skin it adhered to the surface, whereas it is desirable that such a dressing should adhere very slightly if at all. This objection to it I attempted to obviate by spreading it upon gutta percha tissue which, though insoluble in carbolic acid, allows it to travel through its substance. The lac when thus lined with gutta percha proved none the less efficient as an antiseptic, and, being perfectly devoid of adhesiveness and of smooth surface, shed the discharge in a most perfect manner, greatly excelling, in this respect, the lead plaster. But it had one fault, viz., that when subjected to much bending, as at the fold of a joint, the gutta percha cracked and admitted the discharge, which, gradually insinuating itself, detached the gutta percha more or less extensively, and introduced an element of risk through the interposition of a layer of liquid between the antiseptic lac and its lining. This fault has been got rid of by reducing the gutta percha to a mere film, incapable of affording lodgment for fluid, by brushing over the antiseptic lac with a weak solution of gutta percha in bisulphide of carbon, which, rapidly evaporating, leaves a coating of microscopic thinness, yet effectual for preventing adhesion. We have now given this lac dressing a sufficient trial in wounds and abscesses to entitle me to recommend it with confidence.†

* In this respect, lac differs altogether from India-rubber, which, though it may be impregnated with the acid to any degree, parts with it rapidly.

† This plaster is supplied at a very moderate price by the New Apothecaries' Company, Glassford Street, Glasgow, to whom I am much indebted for the interest and pains they have taken in bringing it to perfection. The following is the mode of its manufacture:—Take of shell-lac, 8 parts; crystallised carbolic acid, 1 part. Heat the lac with about a third of the carbolic acid over a slow fire till the lac is completely melted; then remove from the fire and add the remainder of the acid and stir briskly till the ingredients are thoroughly mixed. Strain through muslin, and pour into the machine for spreading plaster; and, when the liquid has thickened by cooling to a degree ascertained by experience, spread to the thickness of about one-fiftieth of an inch. Afterwards, brush the surface of the plaster lightly with a solution of gutta percha in about thirty parts of bisulphide of carbon. When the sulphide has evaporated, the plaster may be piled in suitable lengths in a tin box without adhering, or rolled up and kept in a canister.

For an antiseptic dressing that is intended to be changed from time to time, perfect absence of adhesiveness is a most valuable property; not only because it permits all discharge to escape beneath it into the porous material placed outside to absorb it, but because it avoids traction upon any deeper dressing or upon the skin during the process of withdrawing it, with the concomitant risk of regurgitation of air or liquid charged with living putrefactive organisms.

But for the permanent dressing in compound fracture this complete want of adhesiveness is the converse of what we desire. Here, the material employed, being designed to form part of the scab, should stick to the skin or to anything else that lies beneath it. The lac prepared as above described may, however, be readily made suitable for this purpose, by rubbing off the film of gutta percha by firm friction with a dry cloth, and then brushing the surface over with liquid carbolic acid. It then, at once, assumes a sufficient degree of adhesiveness.

In order to ensure healing without suppuration, it is requisite, as we have seen, not only to prevent the spreading of putrefaction into the wound, but also to protect the raw surface from perpetual stimulation by the carbolic acid. In the mode of dressing above described, in which the putty was employed, the latter object was attained by means of layers of lint forming a crust too thick to be penetrated by the acid supplied externally; and the same plan would no doubt, succeed as well with the lac. But to trust to the mere thickness of a penetrable crust, is not altogether satisfactory. It would clearly be better, if possible, to protect the exposed tissues from the stimulating antiseptic in the lac by a layer of some substance chemically impermeable to carbolic acid. A metallic plate possesses this property; and in its more flexible forms, such as thin block tin or sheet lead, it seems likely, at least in ordinary cases to answer well. I have, as yet, only had an opportunity to try this method in two cases, but both of these have presented points of interest which make them deserving of mention.

Case of Contused Wound treated with Block Tin and Antiseptic Lac.—The first was a contused wound, three inches long, over the lower part of the tibia, with some undermining of the skin, in a young man of 20, occasioned by the limb being violently squeezed between a heavy iron pipe and a fixed piece of machinery. Happening to be at the Infirmary soon after his admission, I dressed the case myself, washing and syringing out the wound with a saturated watery solution of carbolic acid, and covering it with a well-fitting piece of thin block tin of rather larger size, washed with the watery solution, and then applying a piece of lac-plaster, deprived of its gutta percha layer, overlapping the tin freely on all sides. A piece of calico was placed outside the lac-plaster, to prevent adhesion of its edges to a dry cloth, which was wrapped round the leg to absorb discharge, and was intended to be changed. Next day, there was a good deal of sero-sanguineous effusion on the cloth, for which another was substituted, moistened with a solution of carbolic acid in four parts of olive oil. The same was afterwards done daily; the discharge diminishing rapidly, and the limb remaining free from swelling or pain, and the constitution from disturbance, till, on the fourth day, the patient, who was a silly youth, was seized with a desire to see the injured part, and tore off all the dressings. This foolish proceeding on his part gave us the opportunity of making an interesting observation. The wound was found perfectly level with the general surface of the skin, being filled with a clot of smooth surface corresponding to that of the tin which had covered it, while the edges of the skin were pale and natural in appearance. The dressing was re-applied as before, the wound being superficially washed with carbolic acid lotion in the process. Two days later the patient again without any reason, laid bare the wound, which still presented the same characters, except that the surface of the smooth clot showed, here and there, some minute whitish specks, probably in consequence of the action of the watery solution of carbolic acid with which it was washed two days previously. A similar dressing was again employed, the use of carbolic lotion being again necessarily involved. After two more days, that is to say a week after the accident, the patient, though free

from symptoms, having again removed the dressings, the wonnd was again examined. It was free from pus or odour of putrefaction, but its surface was mottled with red and yellow spots, and was not quite level. The dressing was continued one day longer, when it was abandoned, as the patient could not be induced to leave it alone, water-dressing being used instead, and on the following day the wound presented the characters of a healing superficial granulating sore. Two days later he was so unruly that he was discharged for misconduct.

In the following case we have had the opportunity of seeing the effects of this mode of dressing when left undisturbed.

Case of Compound Fracture of the Leg treated with Block Tin and Antiseptic Lac.—On the 3rd of October, 1868, a porter, 25 years old, was unloading a waggon in a warehouse, when a box, weighing about four hundredweight, slipt, and striking him upon the leg, knocked him down over an opening in the floor, through which he would have fallen into the room below had not the heavy box, pressing upon the limb, pinned him down and kept him suspended. When rescued from this situation, he was taken to the Infirmary, where my house-surgeon, Mr. Malloch, found the leg much distended with extravasated blood, with a wound, three-eighths of an inch in length, on the inner side, about midway between the knee and ankle, bleeding freely and communicating with a tranverse fracture of the tibia. A probe smeared with an oily solution of carbolic acid (to prevent the introduction of septic particles) could be introduced beneath the undermined fascia for about three inches in every direction except downwards, and also passed, for the same extent, directly outwards behind the tibia, which was felt to be denuded of its periosteum. Having injected into the wound, with asyringe, several ounces of a saturated watery solution of the acid, and diffused it freely th rough the limb yb pressure, to mix it with the extravasated blood, Mr. Malloch placed a piece of thin block tin about an inch square over the orifice, and, after pressing out as much as possible of the blood and watery solution, applied a piece of lac plaster deprived of its gutta percha lining, overlapping the tin a couple of inches in every direction, and over this a folded cloth moistened with a solution of carbolic acid in four parts of olive oil. The limb was then put up in lateral pasteboard splints. This treatment relieved the severe pain which he was suffering; but it returned in the course of the next few hours, during which very free hemorrhagic effusion occurred. Next day the discharge became greatly diminished, and in the course of the following day it ceased entirely. The pain also left him about twelve hours after the accident and never returned. The after treatment consisted for the first two days, in renewing the oily cloth once in the twenty-four hours; but from the third day onwards the cloth was left permanently upon the limb and merely brushed over with a mixture of equal parts of carbolic acid and oil, the inner splint being raised for the purpose without disturbing the limb, which lay upon its outer side with the knee bent. After the sixth day, the antiseptic oil was only applied once in forty-eight hours. On the third day, some wrinkling of the epidermis indicated subsidence of the swelling which afterwards fell rapidly till, by the eleventh day, the calf was almost of natural size, having shrunk away considerably from the splint. His pulse never rose above 82, which was its number the day after the accident, and his general health was from that time forward quite unaffected.

Ten days after the receipt of the injury, it was noticed that the oily cloth, which for a week past had indicated complete absence of discharge, exhibited an appearance of additional staining, corresponding to two or three drops of red serum which seemed to have been pent up beneath the lac plaster by inspissation of the blood and serum round its margins, till some accidental cause, such as the shrinking of the limb, cracked the dried exudation. Having been led to disturb the dressing to some extent in investigating the source of this discharge, I thought it best to remove it entirely, protecting the wound at the moment of its exposure with a bit of antiseptic lint. The under surface of the lac gave distinct indications of being impregnated with carbolic acid. The wound presented a very interesting appearance. It had

shrunk considerably; but its margins resembled those of a perfectly recent wound; and its orifice was occupied by a projecting dark clot, which to the naked eye scarcely differed from a fresh coagulum. Hence there seemed reason still to hope for healing without suppuration, if the original mode of dressing were repeated. Accordingly, the tin smeared with carbolic acid was replaced, and overlapping it a fresh portion of lac plaster, rendered adhesive by touching it with carbolic acid after removing the film of gutta percha, except in a narrow space from the centre to one side, where the gutta percha was left, to provide for the escape of discharge. A dry cloth and a splint completed the dressing. Two days later, in order to maintain the lac plaster in an antiseptic condition, two layers of calico, moistened with a solution of carbolic acid in four parts of olive oil, were substituted for the cloth; and afterwards, at intervals of from two to three days, the surface of the calico was lightly brushed over with a mixture of equal parts of the oil and acid. For six days, some yellowish serum, amounting at first to one or two minims in twenty-four hours, but gradually diminishing, exuded from below that part of the margin of the lac plaster where the gutta-percha film had been left, the amount being estimated by changing every day a little bit of antiseptic lint placed at the point of exudation. But, after the sixth day, the piece of lint was left unchanged, as the trifling discharge seemed to have ceased entirely. When eleven days more had passed without any change, I thought it well to ascertain again the state of the wound; and on Oct. 30th, seventeen days after the second application of the deep dressing, and two days short of four weeks after the accident, I pulled off the lac plaster with the tin adhering to it. The plaster was still sticking to the skin, and drew away the hairs along with it, except where the gutta percha film remained. At this part, along the course of the track of exudation, the skin had an orange stain, from serum mixed with altered hæmatin, and was moist, except near the edge of the plaster. Beneath the tin, also, there was the same kind of orange moisture. The wound appeared at first sight unhealed, having an orange-red aspect; but, on wiping it with a piece of lint, a perfect cicatrix was disclosed, which had been covered with the remains of the little portion of clot seen projecting from the orifice on the former occasion of exposing it. A piece of dry lint was placed upon the scar; and the splints were readjusted, the fragments being in good position. The case was now reduced to one of simple fracture.

This case presents several features of great interest. In the first place, the appearances disclosed on the removal of the dressings on the tenth day after the accident, afford as good an illustration as could be desired of the fact that the surface of a wound is not induced to suppurate, or indeed to undergo any appreciable change by the contact of a foreign body, destitute of chemically stimulating properties. The carbolic acid with which the surface of the tin was washed, like that injected into the wound, was absorbed into the circulation before it had time to bring about those changes in the part which are the essential preliminary to suppuration. The tissues of a recent wound are incapable of forming pus, however much they may be stimulated, whether by nervous (*i. e.*, inflammatory) excitement, or by chemical irritants, such as the products of putrefaction or pungent antiseptics. It is only when they have been gradually changed under the influence of prolonged abnormal stimulation into that rudimentary form of tissue which, when we see it on the surface of a sore, we term granulations, that they are liable to produce, when still further stimulated, the still more rudimentary pus corpuscle. It is upon this fact that the possibility of obtaining primary union on the antiseptic system depends. The antiseptic applied to the wound in the first instance is a powerful stimulant, but it is absorbed before it has time to bring about granulation in the tissues.

In the second place, it is very satisfactory to see, although theoretically it could hardly have been doubted, that, when a wound has been effectually protected from stimulation and consequent granulation, it may even at a late period after its infliction, be again subjected to the temporary stimulus of an antiseptic application without being made to suppurate; for a knowledge of

this fact will enable us to examine the wound when we think there is a fair prospect of healing being complete, confident that, should the reverse prove to be the case, we can again employ the original mode of dressing without interfering with the process of healing by scabbing.

Thirdly, I may remark that cicatrisation without suppuration beneath a piece of tin, is a novel mode of healing by scabbing. But the ordinary scab is in so far analogous to the metallic plate, that the exudations of which it is composed having dried before they had time to putrefy, the crust is, like the metal, a neutral or unstimulating solid. Further, there is putrescible moisture beneath the scab as beneath the tin; but the mode in which the putrefactive organisms are excluded is essentially different. The scab keeps them out mechanically, by adhering firmly to the surface of the integument; the metallic plate opposes no mechanical barrier to their entrance, but is guarded by a germ poison in the surrounding lac which no less imperatively forbids their access.

Altogether, the case must be regarded as affording great encouragement for giving a further trial to this method, which seems to bring the treatment of compound fracture to something nearly approaching perfection. The lac, being impermeable to discharge, combines the properties of an external antiseptic guard with those of a permanent crust; and, as fresh carbolic acid can be supplied to it as often as may be desired without disturbing its position, the trouble and risk that attended the changing of the putty are entirely got rid of. At the same time the tin protects the raw surface from the acid with absolute certainty, while the tin and the lac constitute together so thin a layer as not to alter the contour of the limb, or interfere with the shape of splints such as would be used for simple fracture; a considerable advantage as compared with the mass constituted by a thick crust, covered with substantial putty. When the wound is large, I would advise the use of two layers of the lac plaster for the sake of additional strength, the outer one overlapping the inner by an inch or two; and the outer, like the inner, rendered adhesive, as above described, so that the two may become incorporated into one mass. Also, I would recommend that, as was done in the second dressing of the last case, the film of gutta percha should be left upon a track leading from the tin to what is to be the most dependent part of the edge of the plaster to afford free egress for sero-sanguineous discharge.

For treating the interior of the wound in compound fracture, I employed, till comparatively lately, the undiluted acid, and, as this afforded excellent results, I did not venture to change the practice without having some more substantial basis than hope to found upon. But rather more than a year ago, having observed that the injection of a saturated watery solution (one part of acid to twenty parts of water) among the fibrous tissues in a fœtid-suppurating wound of the palm, completely arrested the existing putrefaction, I concluded, that if the acid so diluted sufficed to destroy the abounding putrefactive organisms which must have been present among the textures in that case, it must surely be trustworthy for compound fracture, We have accordingly employed the saturated watery solution in all the numerous cases of compound fracture that have since come under my care and in no instance has it failed. If it answers equally well, it is obviously superior to the strong acid, since it does not produce the slightest sloughing from caustic action, and, being a less powerful irritant, causes a less copious serous effusion. Besides it may be injected and diffused among the tissues which are the seat of extravasation with a freedom which could not be used with the acid of full strength, and it is to this circumstance that I am disposed to attribute the fact that we have obtained success at a period after the infliction of the injury which I should formerly have thought quite hopeless, in one case, for example, as late as thirty-six hours after the accident. Lastly, we avoid a disagreeable symptom which we used to observe occasionally after applying the undiluted acid freely to large wounds, viz., obstinate vomiting for about twenty-four hours, occasioned, no doubt, by imbibition of a poisonous dose into the circulation.—*British Medical Journal*, *Nov.* 14, 1868, *p.* 515.

43.—ON THE TORSION OF ARTERIES AS A MEANS OF ARRESTING HEMORRHAGE.

By Thomas Bryant, Esq., Assistant-Surgeon to Guy's Hospital.

[The employment of torsion for arrest of hemorrhage from large blood-vessels was suggested to Amussat by the recognised fact that torn wounds do not bleed. Although at once adopted by Boyer, Dupuytren, Majendie and others, it was little noticed by the surgeons of this country until the introduction of chloroform removed any object in hurrying over an operation. Speaking of acupressure, Mr. Bryant says:]

It has, physiologically considered, one point of weakness which has some bearing on my present subject, for the value of the practice of acupressure rests on what has hitherto been looked upon, and what still must be described, as being a temporary mechanical obstruction to arterial hemorrhage; the permanent arrest of bleeding depending in this practice, as in others, on natural processes; now in acupressure the permanent arrest of hemorrhage depends entirely upon the clot which forms in the vessel, for no evidence has yet been adduced to show that any change occurs in the inner tunics of the vessels which have been subjected to the pressure of an acupressure needle, such as is well known to take place after the use of the ligature, and such as also occurs after the application of torsion in large vessels. In these last two forms of practice the two inner coats are divided, and subsequently unite, the permanent arrest of hemorrhage depending materially on such a process; in acupressure there is no evidence whatever to show that any such union takes place between the two surfaces of the vessel which are brought in contact; as a consequence the permanent success of acupressure depends upon the coagulating power of the blood in the occluded vessel, the needle acting as a temporary mechanical obstruction to the flow of blood during the brief period of its presence.

Physiologically, therefore, acupressure is an uncertain process, and when contrasted with the ligature and torsion stands condemned; for its success depends only upon the temporary processes which nature adopts for the purpose of arresting hemorrhage, and not upon the permanent hemostatic changes which nature employs in other cases.

When Professor Syme, therefore, in a short note published in the Lancet of January 4th, drew the attention of the profession back again to the subject of torsion, I must confess to feeling a sense of satisfaction, for it seemed tolerably clear that, if it could be practically proved that hemorrhage from a divided artery could be safely and permanently controlled by such a method, we should have a means at our disposal which would be entirely free from all the objections which the strongest objector to the use of the ligature could possibly adduce, and which in its simplicity and value would without doubt bear favourable comparison with acupressure as well as with the ligature.

It was under these circumstances that I was thus led to examine into the question, to try it in practice, and to prove it by experiment; and I now propose to lay the results of my inquiries before the Fellows of this Society, with the hope that they will be induced to test the practice for themselves, and by the aid of experiment gauge its value.

I propose to relate seriatim the experiments I have made upon the dog, horse, and human subject to test the value of torsion, and to observe the process by which the vessels so treated become permanently sealed; having previously described the two methods by which torsion has been practised.

I shall pass on to describe the physiological changes which have taken place in the arteries which have been twisted; and drew attention to such special points as it seems necessary to attend to in the application of the practice. Some brief comparison will then be made between the value of torsion and the ligature, and some general deductions drawn up from the consideration of the subject as a whole.

I must add that in most of my experiments I have had the benefit of Mr.

H. Howse's able assistance; that he has given me valuable aid in examining the vessels of the animals after death, and that the descriptions of the physiological conditions of the arteries are chiefly from his pen, receiving from me only such slight alterations as I deemed necessary. I am also indebted to him for the drawing of some of the preparations.

It would be well, however, *in limine*, to premise that there are two modes of applying torsion; one described by Amussat as "free" torsion, the other as "limited."

In *free torsion* the end of the artery should be fixed by a pair of clasped forceps and twisted freely.

In *limited torsion* the artery having been drawn out of its sheath, should be fixed *transversely* about three-quarters of an inch from its divided extremities by a pair of clasped forceps and held steadily; whilst with a second pair the free end of the vessel should be twisted freely as in the former, the object of the first pair of forceps being to fix a limit to the twisting of the vessel and prevent the artery being separated for any distance from its vascular attachments.

[A long series of experiments on the arteries of the dog and the horse are next detailed by Mr. Bryant.]

Experiments upon the arteries of the dead subject.—I have made a large number of experiments on the arteries of the dead subject, healthy and diseased, having generally selected the common iliac and external iliac vessels, and have found that in all the same changes have taken place as have been already described. In every instance the retraction and incurvation of the middle and inner tunics were well marked, and in some the latter was most remarkable; it appears also that in the atheromatous vessels this incurvation is equally well seen.

Indeed this incurvation of the inner tunics of an artery, to which torsion has been applied, appears to be a point of peculiar interest, and from a large number of experiments on the dead subject it may be stated to be a very general result of well-applied torsion.

The amount of incurvation in different instances will, however, be found to vary; in some it will show itself more as an irregular crowding together of the divided and retracted tunics; whilst in others it appears as a complete valvular incurvation of the divided coats, the incurved portions appearing within the vessel as nipple-like projections; under these circumstances, the incurved portions form the most perfect valves it is possible to conceive, being not unlike the semilunar valves of the heart, and closing as perfectly. In some cases, again, the middle and the inner coats appear to split, and thus to form an additional means for causing coagulation of the blood and obstruction to the artery.

This incurvation is clearly a physical act, and is due to the natural elasticity of the coats of the vessels; it may consequently be confidently expected to take place in all the larger vessels.

I have found also that when a vessel has been efficiently twisted, no legitimate force that can be employed with a syringe, introduced into the vessel above, will unfold the twist in the cellular coat, or undo the retraction and incurvation of the inner tunics, although the artery will frequently rupture above the part which has been twisted; when the extremity of the vessel has been twisted off, leakage, however, frequently follows.

It should be stated that this incurvation of the inner tunics seems unknown after the ligature; indeed it should be stated that in a large number of experiments which I have made, in which a ligature has been applied to an artery, the only change that takes place in its coats is an imperfect and irregular division of its middle and inner coats; in rare cases this division is very complete, in many others it does not take place at all.

There is never any retraction worth mentioning, and no incurvation. I may refer to Dr. Jones's work on 'Hemorrhage,' published in 1810, to further illustrate this point.

Résumé of the physiological effects of Torsion on the vessels.—The results of the experiments made upon animals, and the single observation I have had

an opportunity of making on the human subject, singularly accord; for in the cardiac and distal ends of the arteries which had been treated by torsion, I found the middle and internal coats of the vessels had been divided; that these coats had retracted in the direction opposed to the blood stream, approximated and overlapped; that at the cardiac end in several instances the coats had become partially incurved, as shown in the preparations and drawings of the carotid of the horse, and the brachial of the human subject; and I found also that every vessel contained clot, from the giving off of the first branch to the point of contact of the two inner divided coats; that lymph or organizable blastema was poured out around the divided extremities of the coats, and between them and the external cellular coat; also that a second smaller clot often existed between the distal end of the two divided inner tunics, and that portion of the cellular coat which had been twisted.

I found, moreover, that the twist which the cellular coat had sustained was clearly permanent, and that it did not untwist (this can be shown on the dead body). That in no single instance was there any evidence to indicate that the portion of vessel which had been twisted had lost, or was likely to lose, its vitality; or that the parts about the vessel had received any material injury.

That in most cases a kind of ampulla tends to form in the cardiac end of the artery, and sometimes in the distal end. The appearance which this presents, varies in every case, and seems to depend on the rapidity with which coagulation takes place in the end of the artery, and upon the amount to which the artery, beyond the point where the clot forms, contracts. In those arteries, therefore, in which much muscular fibre exists, and in which it is healthy, it will be most apparent; thus it is scarcely visible in the brachial artery from probable atheroma, and in the carotid of the first horse which was an old worn-out creature.

It is not necessary, therefore, to suppose that the force of the heart actually dilates the end of the artery. The diameter of the ampulla is in fact something less than the original cavity of the artery. Fibrin forms here first and prevents that close contraction of the parietes which goes on in other parts, and thus an apparent dilatation is formed. The middle coat in the artery is always much thinner than that in the contracted part of the artery.

Thus the appearance of an ampulla is rather due to unequal contraction than to dilatation.

That though "free torsion" was practised in every case except in the horse, yet the twist in the vessel was local, not extending high up the artery.

That torsion when applied to large vessels immediately above the giving off of a large branch may be successful; and that when applied to diseased vessels in old subjects it may likewise succeed.

Remarks on the Experiments made on Living Animals.—It is to be noticed that in the experiments upon dogs "free torsion" was employed; in the two upon horses "limited torsion" was used. In all the operation was ultimately successful.

In several on the dog, bleeding took place when the torsion had been imperfectly carried out; three revolutions of the vessel being clearly insufficient; in all, however, on the dog four revolutions at once succeeded.

But the arteries of dogs are not large, and although the experiments upon them, as far as they go, must be regarded as satisfactory, they would not be, to my mind, of sufficient value to prove the power of torsion unsupported by others of greater importance.

The experiments on the horse I cannot but refer to with unmixed satisfaction, for no one can look upon the dilated pulsating carotid artery of such an animal during life, without a feeling of astonishment that such a simple act as that of torsion should be found sufficient to arrest hemorrhage from its divided extremity; and yet in both the cases related complete success followed the operation when it had been properly performed.

The temporary failure in the second case which followed upon the imperfect application of the practice must be looked upon with favour, for it went to prove what I confidently anticipated would have been the case—that torsion of the external coat when too much concentrated to one spot must end

in its rupture, and consequently in failure: but the ultimate success of the torsion when carried out in an efficient manner was most satisfactory, for it tended to show that the means employed were such as could be relied on with some confidence.

The fact that torsion was successfully performed on the carotid of a horse, immediately above the giving off of a large branch is a point of great value, for if the permanent safety of torsion depended upon the mere coagulation of the blood in the vessel, success could not have been thus acquired—for as the drawing, model, and preparation well show, there was no room for such an obstruction to the arterial flow to take place between the twist in the cellular coat, and the point at which the branch artery was given off.

It would thus appear that the twist in the cellular coat was the chief cause of the arrest of the arterial hemorrhage in the experiment referred to, and that this twist with the adhesion of the split, *retracted*, and approximated middle tunic forms the true permanent occluding medium of a divided vessel; that upon such points the main safety of the practice of torsion really rests, the coagulation of the blood in the vessel acting a part of secondary importance.

As mere experiments, these operations on the horse must be looked upon with favour; for they prove practically that torsion of such a large artery as the carotid is to be relied on; and consequently it does not appear unfair to believe that the same practice applied to any smaller vessel would be equally successful. As physiological experiments, however, the observations I have been enabled to make must be regarded in a higher light, for they show that nature's well-known hæmostatic processes act at a far greater advantage when torsion has been applied, than they do after the use of the ligature; and what is of far greater importance, they are allowed to go on undisturbed in their conservative action, for there is no foreign body to set up ulcerative action in the vessel in the seat of its occlusion; nothing to undo at a late period of the case what nature, assisted by art, has done at the beginning for the prevention of arterial hemorrhage. The twist in the vessel remains permanent; the coagulation of the blood in the meshes of the retracted, approximated, and incurved middle coat goes on undisturbed; and the whole becomes, subsequently, rapidly condensed into one homogeneous mass by the effusion of lymph from the exposed surfaces of the divided tunics.

In the application of torsion some care is needed, and as two methods have been described, the "free" and the "limited," it may be well to point out as far as possible the conditions under which they should be employed.

"Free" torsion appears to be the more applicable to small vessels, and even to the large trunks of the extremities; the "limited" torsion to such arteries as are unsupported by muscles and loosely connected.

It will have been observed that in all my experiments upon dogs, in which both carotid and femoral arteries were treated by torsion, the "free method" was used; and in the single example I have quoted in which I adopted the practice in a large vessel on the human subject—amputation of the arm high up—free torsion was also employed; for in that case I passed one blade of my forceps into the humeral vessel for about half an inch, and, with the other outside, after four complete revolutions the operation was successfully performed. I have, since this paper was written, applied free torsion to the femoral artery of three adult patients with complete success, On the dead subject also this mode of torsion proves successful, particularly on the femoral, brachial, and carotid arteries. It should also be stated that Amussat in his last years employed the *limited* torsion in all except the very small vessels; whilst Thierry employed the *free* in every case.

Three or four revolutions of the artery are required for small arteries, five or six for large: when the vessels are atheromatous the former number (three or four) is amply sufficient under all circumstances.

The orifice of the artery alone should be held by the forceps which twis the vessels in both cases.

In no case does it appear necessary, or even prudent, to twist the vesse

till the end is twisted off: for by so doing we do away with the chief safeguard against bleeding, we run the risk of breaking up the valvular incurvation of the inner tunics, and disturb the clot which forms between the retracted ends of the two inner tunics and the twisted cellular coat. In very small vessels this point is not of so much importance. It is probably due to this error of twisting off the ends of the vessels, that the practice of torsion has failed to hold its ground, for in the few cases in which it has been employed, such a mode has been generally, if not universally, adopted.

It seems to be a good rule in every case of torsion, whether free or limited to hold the end of the vessel for a second or two after the twists have been made, to allow of the parts becoming plugged with blood, and the divided tunics to retract and come in contact.

It appears also to be a matter of great importance in twisting large vessels that the whole orifice of the artery should be seized and firmly held; this cannot be well done with the forceps ordinarily sold, but can be by the forceps I have had made for the purpose by Mr. Millikin of Southwark street, the ends of which are broad, and firmly hold the artery, and not having sharp ends do not tear it. The blades are closed by a simple catch. With a small pair of forceps the surgeon is very apt to tear out a piece of the end of the vessel and not twist it securely. I have proved this on many occasions on the dead body.

The forceps I have made for holding the vessel are very simple, they fix it firmly with flat surfaces without injuring the external coat, which the sharply-teethed forceps are apt to do; they are also very well adapted for the twisting of vessels of moderate calibre.

By way of summary the following conclusions may be drawn up.—1. That hemorrhage may be arrested by torsion from even the largest vessels.

2. That it is a safe and judicious practice in all cases in which the vessels are small and of moderate calibre; and that, as far as experiments and practice yet prove, it is equally so in arteries of the first magnitude.

3. That torsion may be "free" or "limited;" the *free* method being applicable to vessels of moderate size, and even to the largest of the extremities; *limited* torsion being more adapted for the large and loosely connected vessels.

4. That in *torsion* as in the *ligature* the permanent hemostatic processes are alike due to the sealing of the divided inner and middle tunics; but that in the ligature there is only an irregular division of these tunics, whilst in torsion there is a complete division, separation, retraction, and valvular incurvation.

5. That in torsion the *twisted cellular* coat forms, with the retracted and incurved middle coat, the direct mechanical obstacle to the flow of arterial blood, in the same way as the *compressed cellular* coat does in the ligature; but that in torsion the twisted cellular coat and incurved middle coat become subsequently a permanent means of occluding the end of the artery; whilst the ligature of necessity becomes subsequently a source of irritation, and too often a means of undoing what has been done by nature's own hemostatic processes.

6. That in *torsion* the twist in the cellular coat of an artery; the division and subsequent retraction, incurvation, and adhesion of the middle coat; and the coagulation of the blood in the vessel down to the first branch, are the three points upon which its temporary as well as permanent safety depends; whilst the permanent safety of *acupressure* rests only upon the last point alone, and its temporary effects upon the pressure produced by the needle.

7. That there is every reason to believe that when torsion has been successful on its first application, the fear of subsequent hemorrhage is altogether groundless; for there is nothing, as there is in the ligature, to interfere with the physiological processes set up by nature to occlude the divided vessel; and, unlike acupressure, the temporary obstacle to the flow of blood becomes a permanent one.

8. That upon physiological grounds torsion has decided advantages over the ligature and the acupressure needle; and that if subsequent experience

confirms what has been hitherto observed in the experiments on animals and the application of the practice in the human subject, we shall have gained a point of no mean importance and simplified surgery in no slight degree.—*Medico-Chirurgical Transactions*, *Vol.* 51, 1868, *p.* 199.

44.—ON ACUPRESSURE AND TORSION.

By J. Cooper Forster, Esq., Assistant-Surgeon to Guy's Hospital.

In many cases, torsion has a great advantage over acupressure, but it is not always easy of application; nay, in some instances it is applied with great difficulty, and should a portion of the vessel perchance be torn off and hemorrhage still go on, the further practice of torsion becomes exceedingly troublesome. It is impossible to say why the practice, adopted first by Amussat, was given up by the French surgeons—perhaps the difficulty of its application without chloroform may have been one reason, but I can scarcely imagine such to have been the case. In the few instances where I have used it there has not been any trouble in applying it, and certainly nothing that would induce me to abandon the practice on any such grounds.

The great recommendation for the employment of acupressure has been generally asserted to be that thereby adhesion—entire or almost entire—of the whole of the wound would more frequently occur than at present, but on reviewing the cases which have fallen under my notice, in no one instance has there been an entire absence of suppuration, with such complete adhesion as I had been led to expect and hope for. I must confess here to a certain amount of disappointment. I hear it also stated by the warmest advocate of acupressure that torsion leaves a small piece of sloughy tissue in the wound which acts injuriously by preventing the entire adhesion of the surfaces. Supposing there to be truth in this statement, we are no worse off if we get no more adhesion by acupressure than by torsion, and surely out of forty cases one or two at least might have afforded me a happy result. One of the undoubted advantages of torsion is the absence of a foreign body of any description in the wound. It is even simpler than the use of pins for twenty-four or forty-eight hours, and if it answers equally well I think it should be employed. But there are cases where I think the use of both means for arresting bleeding may be advantageous; the combined plan in the patient upon whom I adopted this double treatment for the arrest of hemorrhage was more successful than torsion alone—indeed, there seems to be a greater trouble in applying torsion to the smaller vessels than to the larger ones.

Professor Syme and Dr. Humphry have now brought forward so many cases in which they have employed torsion that no one can believe for a moment that there need be the slightest fear of trusting a large artery thus treated: and from what I have done in the few cases mentioned, I believe it bids fair to realize the hope I expressed at the termination of my last communication, that some plan even more convenient than the pin and wire might be found as a substitute for them: such at present appears to be the result of torsion.

Experiments on animals are of little avail in establishing the security of the torsed vessels—the French surgeons made enough of these trials many years ago to satisfy any one, and with the happiest results; yet the practice of torsion was abandoned by them because (so far as I can gather) suppuration occurred in the human subject along the course of the arteries.

I have not yet heard of any such results following the practice at the present day. The time occupied in the performance of torsion is somewhat longer than that in applying the pin and wire, and in the smaller vessels there is no doubt, considerable trouble sometimes experienced in applying torsion, and it may be advisable to have a pin and needle at hand so as to combine the two plans, as in the vessels of small size the pins can always be removed in twenty-four hours or less.

I have no hesitation in saying that two of the cases which have occurred

this year have given me considerable anxiety as regards acupressure—one of them more especially, as the pin was kept in seventy-two hours with a view of preventing any hemorrhage, and yet on its withdrawal so feeble was its hold that a sudden gush of blood took place. I should mention that the whole stump had sloughed, and whether the same result might have occurred with torsion (it most probably would eventually have done so with a ligature) I cannot say; probably any means would have failed, but as acupressure was under trial I was disappointed at its failure.

Some length of time must necessarily elapse before surgeons will be inclined to expose their patients to what, in the minds of many is considered a hazardous condition: there is a certain sense of security given in the case of a ligature being applied which affords to the surgeon a guarantee that for the present at least he will leave his patient in a safe state; but he forgets that there is a danger of hemorrhage arising when that ligature is separating, probably as great as on the removal of the pin. Amussat described the inner coat of the vessel as being folded up, and this condition would appear to act as a preventive of bleeding equally secure with the plan of tying a ligature around the artery, and certainly more secure than acupressure.

During the last two years I have in no case used a ligature where any attempt has been made to obtain adhesion in a wound, nor where I have been able to practise torsion. It is thus difficult to see in what cases ligatures need be used at all.—*Guy's Hospital Reports*, *Vol.* 14, 1868, *p.* 172.

45.—ON THE PROCESS OF TWISTING ARTERIES FOR ARREST OF HEMORRHAGE.

By Dr. James D. Gillespie, Surgeon to the Royal Infirmary, Edinburgh.

Though it has of late been brought very prominently into notice, there is nothing new in this method. It has long been known, and occasionally practised.

Amussat was a strenuous advocate in its favour, recommending and practising its employment even in large arteries. The idea appears to have been suggested by what has been observed in cases of forcible avulsion of a limb, it being notorious that, as a rule, under such circumstances the arteries do not bleed; and when examined, they have been found with the internal coats curled up and torn, while the external was twisted over them, and drawn out to a point.

It is easy to understand how the suggestion arose,—Why not imitate nature when you are artificially removing a limb? And accordingly twisting an artery of small or even medium size has been repeatedly put into successful practice. Certain little accessories are, however, essential to obtain satisfactory results.

The point of the artery must alone be seized, and it must be slowly twisted till the portion included in the forceps comes away. If this is not done, and as I have repeatedly seen, the teeth of the forceps, after twisting for a little, are unclasped, the artery is sure to unroll itself again and bleed more fiercely than ever.

I have given this method of arresting hemorrhage a fair and ample trial, having, as well as my colleague, Professor Syme, trusted to twisting alone for occlusion of the femoral after amputation, and with entire success. I would not, however, in the present state of our knowledge, advise you to adopt twisting for the largest class of blood-vessels, for I believe that their vital powers are often impaired by disease; and besides, we know that arteries do not always, though generally, when forcibly torn across or twisted, become safely closed orifices; reaction may burst the barrier, and produce serious if not fatal hemorrhage. For the smaller vessels there is nothing better, for neither the slough of the artery nor the pus-absorbing ligature is left in the wound, nor is the patient put to the pain—for he almost invariably expresses much pain at such a time—of having a lot of needles pulled

through a sensitive cut and resisting surface, when it is necessary to have them removed.

Its only failing is, that in extensively diseased parts the artery sometimes breaks instead of twisting, or in some situations the vessel retracts beneath a band of fascia, and all attempts to isolate and twist its orifice may be found ineffectual.—*Edinburgh Medical Journal, Jan.* 7, 1869, *p.* 583.

46.—ON TORSION OF ARTERIES.

By Dr. G. M. Humphry, F. R. S., Professor of Anatomy, and Surgeon to Addenbrooke's Hospital Cambridge.

For several months I have used torsion exclusively, with one or two exceptions, after all operations in hospital and private practice. The operations have included three amputations in the thigh, in each of which I twisted the femoral as well as the other arteries; amputations in the leg and forearm, and of the breast; removal of tumours; excision of the knee, &c.; and it has answered perfectly well. The wounds were closed immediately by suture, and there was no after hemorrhage in any of the cases.

I do not mean to say that torsion is quite so easily or quickly done as is the application of the ligature. It requires more care and, I think, rather more time. In tying an artery, it is not absolutely necessary for the orifice of the vessel to be included in the grip of the forceps; it is sufficient if it is included in, and the mass tied by, the ligature. But for successful torsion, the artery itself must be held between the blades of the forceps; and it is not always easy to be sure that this is the case. It may not be seized at all, or it may slip on one side as the blades of the forceps are closing. Accordingly, I have often found that the twisting has failed; and I have made, not unfrequently, two or three false attempts, so prolonging of course, the operation. Still I always persevered, and have succeeded at last in every instance; and I have never yet known an artery bleed in the human subject after I could be sure that it had been really twisted. Again, the artery should be held in the forceps in, or nearly in, the direction of its axis: the rotation of the forceps in that axis being necessary to secure proper torsion. If it be seized across its length, as not unfrequently happens unless care be taken to avoid this, it is simply turned upon the rotating blades, and torn across, instead of being twisted.

In accordance with the observations made on the dead body, and recited above, I have simply seized the end of the artery with the forceps, not drawing it out or holding it with a second pair of forceps applied higher up; and have rotated the forceps till they were free, the piece of the vessel included in them being twisted quite off. This may require ten or a dozen rotations of the forceps; and I am careful to go on twisting till the severance is quite complete, not allowing myself to withdraw the forceps till every thread is divided by the twisting, being fearful lest the pulling upon any undivided portion of the outer coat should tear it, or prevent or disturb that complete twist which my experiments have shown to be so important. Lastly, I examine the twisted end well, to ascertain whether there is any leakage.

One advantage of torsion is, that we need not hesitate to apply it to every vessel which bleeds, or which seems likely to bleed after the wound is closed. We are unwilling to leave thirty or forty ligatures in a wound; but we may twist that number of vessels without any compunction, and thus diminish the oozing which sometimes takes place after the closure of the wound, and, by separating its surfaces, prevents their union. This occupies a little more time, which, under chloroform, is of no great consequence; and it may prevent much subsequent trouble, or even danger.

I have observed that the pain suffered after the operation has been less than when ligatures were used.

To form a correct estimate of the effect of torsion, as compared with ligature, upon the healing of the wound, will require more extended experience. My

own observation is, thus far, certainly in its favour. Some of the wounds, in which several vessels were twisted, have healed quite up at once without a drop of pus, which could not have taken place if ligatures had been used. In the last amputation in the thigh, the patient being a man aged 50, the wound healed by first intention, with the exception of a small tract at one part, which soon closed. In two of the amputations in the leg, sloughing occurred from causes quite independent of the torsion; and there was no secondary hemorrhage. In such cases as excision of the knee, torsion promises to be especially valuable, enabling us to secure, without the presence of a foreign body, any small vessels that may bleed or be likely to bleed. I have used it in two cases of excision of the knee, and in both the wound healed up at once.

I think, therefore, that, in amputations and other operations, all vessels short of the size of the femoral artery, as a general rule, may and should be secured by torsion; that the healing of the wounds will be thereby expedited; and that in the greater number of operations, the ligature may with advantage be superseded by torsion.

The femoral artery may also be twisted with success. It was so in the three instances that I have tried; but it must be admitted that my experiments throw a doubt over the applicability of torsion to arteries of large size.—*Brit. Medical Journal, Jan.* 9, 1869, *p.* 25.

47.—THE USE OF COMPRESSION IN CERTAIN SURGICAL CASES.

By Dr. C. H. Higgins, formerly Surgeon Somerset County and Birkenhead Hospitals.

[Any remedy for "sprains" is welcome, if reasonably likely to succeed, for who has not often experienced disappointment in their lingering cure.]

The plan then which I have pursued during the last four or five years in all cases of sprain is as follows:—immediately on seeing the patient and satisfying myself of the nature of his accident, I plunge the injured joint, say the ankle or the wrist, which are the parts most exposed to sprain, into a vessel containing water as hot as can be borne, and keep it there for at least two hours, maintaining the temperature of the water by fresh quantities of the hot. At the end of the time specified, I find the pain of the part considerably mitigated, and it is, of course, very greatly distended and swollen. Having next carefully dried the part, I proceed *at once* to strap it, (if the ankle, from the toes to the middle of the calf, and if the wrist, from the fingers to the middle of the fore-arm,) as *tightly* and *equally* as I can, with common adhesive plaster cut into strips an inch wide, placing each succeeding piece so as to overlap the preceding one by about a quarter of its width. I always put on two such layers, and finally I direct the patient to keep the horizontal position, on no consideration to meddle with the dressing, but if much pain or distress is set up to take an opiate on retiring to rest. Upon visiting my patient on the following day, I usually receive some account of a restless night during the first hours, but subsequently of sleep and diminution of pain, &c. The plasters are generally quite loose from the shrinking of the limb, which is moreover now said to be comparatively free from pain, unless handled roughly—though of necessity much discoloured; having removed the plaster, I immediately replace it by fresh strips laid on as firmly, evenly, and extensive as before; in short, exactly in the same way as on the first dressing, insisting of course on a continuance of the recumbent position. On the third day of the accident I repeat the process, this time, however, allowing two days to intervene, and I permit some movement about the room. At the end of the two days, I renew the plaster-dressing exactly as on the previous occasions, and generally for the last time, retaining this dressing until it loosens itself off, which usually occurs in three or four days, by which time I find the patient able to use his limb, and free from pain; in short cured. Such is my proceeding in ordinary cases of sprain; where the accident is of unusual severity, I have had recourse to *six* relays of plaster instead of *four*, and up to

the present time with equal success, though the cure is generally delayed three or four days or so longer.

The first case I treated on the above plan was that of a former student of the Liverpool Medical School, residing at the time on this side of the river, and at present a Surgeon in the army. This gentleman took it into his head to leap down the last four or five steps of a common flight of stairs with an adult sister in his arms. He fell with his right foot doubled under him, and suffered a most severe sprain of his ankle. I saw him shortly after the accident and found him in intense agony, &c., and quite unable to move his foot, which was already much swollen. Not having perfect confidence in my plan of strapping, I immediately applied a full number of leeches, and then had his limb well fomented and ultimately enveloped in a bran poultice, and enjoined complete rest in bed. The following morning I repeated the leeches and fomentation, as there were still considerable pain and distention. On the subsequent day, I timidly commenced the plan of compression, using for the purpose a common firm calico bandage, which I applied firmly. As he expressed relief from the support, I rigidly continued the compression, removing and re-adjusting the bandage as the swelling diminished. Three weeks from the date of the accident, he was able to draw on an ordinary Wellington boot and go out shooting; and in a couple of weeks more he reported himself as quite recovered, and resumed his studies.

The next case I was called to was that of a lady, about 45 years of age. She slipped down the kitchen stairs, sustaining a sprained ankle. I saw her three or four hours after the fall, and found her ankle swollen and intensely painful. I caused her to foment the limb for a couple of hours. At the end of that time, having reasoned myself into more confidence of the method, I tightly strapped the foot and ankle, from the toes to the middle of the leg, with strips of ordinary adhesive plaster. She bore the strapping for some hours, but at length, becoming impatient of the distress occasioned by the dressing as she supposed, before my visit on the following day, she had loosened and to a great extent removed it. I re-adjusted the strapping; and on the next day, finding she had again loosened it, I applied, in place of common adhesive plaster, emplastrum roborans, spread on linen and cut into strips like the former. Seeing me so determined, and not finding it quite so easy to remove the new strapping, she had not meddled with it; and after two or three days more, perceiving that the swelling had greatly diminished and the plaster consequently loose, I applied fresh strips as firmly as I could. The parts were by this time much less painful, and reduced, and my patient, being now convinced of the advantage of the compression, contentedly submitted to two or three renewals of the plastering, and in a month from the accident she was quite recovered, and able to walk about well.

Another case was that of a young gentleman, about 20 years old, who severely sprained his ankle in leaping from the landing-stage on to one of the Woodside boats. He was brought home, not being able to put his foot to the ground, and I saw him three or four hours afterwards. He complained of great pain, and his foot and ankle were much swollen and discolored. I had his foot placed for a couple of hours in a bucket of water as hot as he could bear it, and then tightly and evenly strapped the limb in the way already described, from the toes to the middle of the calf, and enjoined the recumbent position; the next morning he reported a somewhat restless night and some distress from the plaster, which, as usually happens, I found loose, from the shrinking of the parts. I restrapped the limb tightly, and he expressed himself easier when the operation was finished. Two days afterwards I applied fresh plaster, and again in two days, as the limb had now nearly returned to its usual size; this was the last application of plaster, for he could now walk tolerably about the room. At the end of ten days I saw him dancing at a party, and in one fortnight from the date of his accident he returned to his office duties, perfectly recovered.

The next opportunity I had of testing my method of treatment was in the case of an officer in one of the Inman line of steamers, who had a fortnight

before sprained his ankle by slipping on the ice at Halifax, *i. e.*, the day before he sailed for Liverpool. He was entirely laid up during the voyage, and when he reached home was quite lame, and suffering from pain in the ankle joint. I pursued the plan I have already so fully detailed in the former cases. He underwent four strappings, and at the end of one week, though still wearing the last dressing, he was able to walk about without pain or limping.

Lately, one of my sons in leaping a gate fell, and sustained a most severe sprain. I pursued precisely the same plan as in the other cases, and though he suffered some considerable discomfort from the first application of plaster, he recovered without a drawback, and in less than a fortnight, though much discolouration continued almost up to the knee, he was able to resume his office duties, which entail on him a great deal of walking, without pain, &c.

A short time ago I had the opportunity of testing my plan upon myself, and, what is more, of contrasting it with the treatment I was subjected to for a similar accident some years previously. I was returning home some months since, late at night, from a patient's house, and stumbled over a large stone carelessly left in the road, and met with a severe sprain of the left wrist-joint. My hand was quite powerless, and extremely painful. I caused straps of plaster, in the usual way, to be tightly applied, from the base of the phalanges to about four inches above the wrist. These were renewed three times, and in five or six days I was free from uneasiness, and could use my hand almost as well as ever, and in a couple of days or so more had quite recovered, and have never felt inconvenience since.

From this accident to myself, I need scarcely say, I had an opportunity of measuring the amount and sort of discomfort occasioned by the first application of the strapping. This I found to extend over only the first six or eight hours, and, though certainly sufficiently distressing, it was by no means so great as I had anticipated, and consequently quite worth undergoing to ensure the after benefits of the treatment, and indeed quite compensated by the sense of security and support it produces, the absolute immobility in short, of the injured structures.

I have lately had an opportunity of proving to some extent the efficacy of compression, by the method I have described, in two or three cases of contusion, also in one case of dislocation of the elbow joint, in a member of my own family; and I may add also in two cases of gout in the foot. Here I delayed the application of the plaster strips until all inflammatory appearances had subsided. The benefit of the compression in both instances was considerable, not only from the support it afforded, but also by inducing absorption of the insterstitial deposits.

When we reflect upon the nature of a sprain,—that it is indeed a kind of subluxation, a more or less partial and temporary displacement, as it were, of all the structures about a joint, accompanied by considerable stretching, and even laceration of its ligaments, its tendons, its fasciæ, its vessels, and its nerves,—I think we shall be safe in acknowledging that a judicious system of compression, early employed, must be a more efficacious method of treatment for its cure than the old temporising plan of leeches, cold lotions, stimulating liniments, &c., &c., with ultimate timid bandaging.

By compression, employed in the manner I have endeavoured to point out, I do believe we can bring about, more surely and more quickly and more comfortably to the patient, the various desiderata in the cure of sprains and similar cases. In the first place, we may ensure the complete, the absolute immobility and repose of all the injured structures. In the next place, we are enabled to restrain the greater amount of the extravasation and effusion which will of necessity be poured out, in and around the joint, unless prevented. And we may also promote at once the re-absorption of all interstitial outpourings, be they of blood or of serum, which so frequently complicate the recovery in such cases, and compromise the symmetry of the parts, and we can restrain within due bounds the tension and vascular action of the parts. And lastly, I am sure now, from experience in my own person, that

we shall conduce to the ultimate and not long-delayed relief of the parts involved, and therefore to the general comfort of the patient.

Whatever may be the worth of my explanation of the *modus operandi* of compression, as I have recommended it, in sprains and contusions and all analogous cases, I can unhesitatingly vouch for the superior efficacy of this plan of treatment. And if I succeed in merely drawing attention to my suggestion, I shall be satisfied, and shall feel at least *non ego frustra*.—*Liverpool Medical and Surgical Reports, Oct.* 18, 1868, *p.* 97.

48.—AN ARTERY COMPRESSOR SUGGESTED FOR THE TREATMENT OF SOME SURGICAL ANEURISMS.

By Gorges H. Porter, Esq., President of the Royal College of Surgeons in Ireland.

Independent of the ligature, various attempts have been made to arrest the current of blood through exposed arteries, and to occlude them rapidly, or by degrees. Most ingenious appliances have been devised for the purpose, but they have never met with much favour at the hands of practical surgeons. Yet how painful it is to meet with cases of aneurism in situations where the experience of bold and able men tells that little can be done to save life. Among those who have endeavoured to close arteries without cutting through their coats may be mentioned Crampton, Percy, Deschamps, L'Estrange, Assalini, Dubois. If, however, their instruments be scrutinized, I think it will be found that the disturbance to the vessel both in applying and removing them was too great, and the amount of pressure far beyond that required. In some situations the ligature has invariably failed, secondary hemorrhage following its separation. To meet such difficulties is my object. That the axillary artery could be compressed between a silver probe and loop of wire for *fifty-two hours* without damaging the vessel, I perfectly satisfied myself. I reported the case in the number of this Journal for November, 1867. In the instance I refer to the artery was not occluded, but considerably narrowed at the point of acupressure. No laceration of either the internal or middle coat took place, nor do I believe such a condition requisite to close a vessel.

Strongly impressed with such an idea, I consider a modification of acupressure may yet be brought to aid the practical surgeon in the cure of aneurisms hitherto unmanageable. The little instrument I venture to suggest to the profession is in reality a form of acupressure, simple in construction, easy of application, and yet powerful in restraining the current of blood, without rudely inflicting injury on the arterial coats. It consists of a piece of silver wire about the strength of an ordinary probe; this is bent into a triangular shape about four inches in length, and the apex surmounted by a small ring; the base is perforated by two little apertures just large enough to permit a fine wire to pass easily through. The wire is first carried round the denuded artery in an aneurism needle with greater facility than a thick ligature, and each extremity of it passed through the holes in the compressor; one end should be fastened by twisting it through the little ring at the top, and the compressor may then be gently pushed down on the vessel, when, by pulling the free end of the wire, the requisite pressure may be made to arrest the flow of blood through the artery. The wood-

out gives an accurate representation of the compressor, and the manner in which the wire is passed through, forming the loop which, with the instrument, incloses the vessel in such a manner that slipping is impossible. When the artery is sufficiently occluded to stop the current, the free wire may be fastened also to the ring. The instrument can be removed with the greatest facility when pressure is no longer required, by cutting the wire at each side, lifting up the compressor, and then gently pulling the wire away from beneath the artery. I have placed this instrument on the femoral artery in the dead subject, and it closed the vessel so tightly that it prevented the injection of water through the artery, and the internal coat was not in the slightest degree injured. I have not had an opportunity of testing it in the living, but I suggest it to the notice of my professional brethren, hoping that they may be induced to give it a trial. We know that aneurisms have become consolidated, and cured in a few hours after shutting off the supply of blood to the sac, and should such a happy result follow the use of this instrument, it might at once be removed without having done any injury to the vessel; or if, on the other hand, it had been permitted to remain for fifty or sixty hours without curing the aneurism, it might be taken away, no harm having been done by its presence. It is so light in construction that no inconvenience is likely to be produced whilst in the wound leading to the denuded artery. Its action imitates, as nearly as possible, acupressure, which we know *efficiently* closes the cut extremities of large arteries.—*Dublin Quarterly Journal, Feb.* 1869, *p.* 8.

49.—TEALE'S MODE OF AMPUTATION.

[Mr. WHARTON, of Dublin, in a short article published in the British Medical Journal, of October 31, 1868, proposes to modify Teale's amputation, by dispensing with the short posterior flap. In answer to this Mr. Pridgin Teale writes:]

The reason why my father considered the short posterior flap to be necessary was this; that the posterior flap, being made as a rule of the powerful flexor muscles, retracts immediately almost to the point at which the bone is to be sawn through. If, however, the posterior tissues be divided opposite the point selected for sawing through the bone, they immediately retract to a point higher up, and thus leave the posterior surface of the bone projecting and denuded of soft tissues.

This fact would not be evident in practising the operation on the dead subject, in which the flaps, from non-retractility, appear superabundant.—*British Med. Journal, Nov.* 7, 1868, *p.* 509.

50.—ON AMPUTATION OF THE JOINTS.

By BERNARD E. BRODHURST, Esq., Lecturer on Orthopœdic Surgery at St. George's Hospital.

Anchylosis is either true or false. True anchylosis, or synostosis, implies that the soft structures of the joint have been destroyed, and that bony union has taken place between the adjacent bony surfaces; and by false anchylosis is understood the formation of membranous or fibrous adhesions within or external to a joint, and which interfere with motion.

False, partial, or fibrous anchylosis is induced, then, by the deposition of lymph within or around a joint, through which adhesions are formed which interfere with motion. Motion may be only slightly impeded, or it may be, in fact, lost. If the muscles about a joint, or the tendons which pass over the joint can be rendered prominent or tense, anchylosis is not complete; neither is it complete, or bony, should the slightest motion remain. And even though motion be lost, the same sensation of solidity is not imparted to the hand on grasping the limb firmly above and below the articulation, as when bony anchylosis has taken place.

Fibrous or false anchylosis may be divided into two classes, which may be severally designated extra-capsular and intra-capsular.

Extra-capsular anchylosis depends on inflammatory action, such as is induced by burns, phlegmonous erysipelas, mechanical injuries, and indeed every form of inflammation through which lymph is deposited around a joint; while intra-capsular anchylosis is occasioned by various forms of inflammation which have affected the structures within the joint, and through which adhesions have been formed.

Thus, the fibrinous deposit, whether within the joint or external to the capsule, becoming organised, occasions false anchylosis.

Lymph is poured out into the cellular tissue around a joint, and about the sheaths of the tendons and muscles in the immediate vicinity; it becomes organised, and the parts are more or less matted together and fixed, whether in an extended or a flexed position, and their functions are impaired. And when the interior of the joint is affected, instead of that portion of the limb external to the capsule, then, in a somewhat similar manner, adhesions are formed between opposed surfaces, the inflammatory product becomes organised, and motion is hindered. Both in intra- and in extra-capsular inflammation the amount of injury to the limb will depend in some measure on the character of the inflammation. It will depend much more, however, on the mode in which that inflammation has been treated; whether attentively from the commencement, with absolute rest, or negligently—allowing the use of the joint. And in proportion as the inflammation is of long duration, so in all probability will the adhesions which form be dense and extensive. When, however, disease is arrested, and the interior of the joint is restored to a healthy condition, the adhesions which have formed may be so dealt with that motion may be restored. In many cases the adhesions are slender, and although slender they may entirely prevent useful motion; or, again, they may be more extensive, and yet yield and allow of increased motion. When the articular surfaces occupy their normal positions, and the interior of the joint is restored to its integrity, motion may be restored. It is a notion now for ever banished, that partial anchylosis has yet to be endured, and that surgical art can offer no remedy.

In many cases of partial anchylosis there is, also, partial displacement of the articular surfaces. Some of these admit of rectification of the position of the limb; in the majority of instances, however, this amelioration can only be partially accomplished, and it cannot always be maintained even after tenotomy. It need not be said that there is no hope of restoring motion, in a permanent manner, unless the position of the limb as regards the articular surfaces is first restored.

The *treatment of partial anchylosis* may be divided into—1st, gradual extension with or without tenotomy; and 2nd, forcible flexion of the limb, with or without tenotomy, and subsequent gradual extension.

In all cases of partial anchylosis there exists some muscular rigidity; in some also, cicatrices are found, resulting from loss of substance. In cases where the adhesions are recent, contraction of a limb will probably yield to continued extension—such extension, namely, as is made by means of a well-adjusted instrument for the purpose; but, except in cases of recent adhesions, it is generally necessary to commence the treatment by dividing the tendons of rigid muscles, and by dividing, subcutaneously, cicatrices. It is better to proceed at once to these subcutaneous sections rather than to prolong the treatment by extension unnecessarily; for, except when the adhesions are recent, simple extension is seldom so efficacious as when it is combined with subcutaneous sections. Even partial displacement of the articular surfaces is easily produced by continued extension without tenotomy. Indeed, this is not unfrequently seen to result at the knee when extension is long continued with rigid muscles. And, therefore, whenever it is desired to remove the contraction of a limb by extension, it is the rule first to divide the tendons of rigid muscles, and to divide cicatrices subcutaneously, and subsequently to proceed gradually to extend the limb.

But if such be the law of treatment where the articular surfaces occupy

their normal positions, it is even more to be insisted on when any displacement has taken place. Extension should then without fail be preceded by the subcutaneous section of such tendons, fasciæ, and cicatrices as might interfere with the readjustment of the articular surfaces.

These obstacles to extension then having been removed, a well-adapted instrument is to be applied to the limb, and extension is to be made slowly. The instrument should support the limb efficiently; and it should always, in the first instance, be applied to the limb at the same angle at which the limb was held before the subcutaneous sections were made. So soon then as the punctures have healed, extension may commence, and be continued without pain, and without producing displacement.

Numberless cases, however, exist in which the means above-mentioned are useless to restore to the limb either the normal position of its parts or to restore motion; cases, for instance, in which the adhesions are so firm that they do not yield to gradual extension; sloughs may be caused, and dislocations, partial or complete, may be produced; but the adhesions, whether intra- or extra-capsular, remain firm and unyielding. Injury alone, but no useful result, can accrue from gradual extension in these cases. Before chloroform was introduced, these were among the *opprobria* of surgery. Then, and indeed later, gradual extension of such limbs was continued for months without any advantage being derived; and the same system has been applied even where bony union rendered any benefit impossible.

Thus it is necessary, before proceeding to the treatment of a case of this kind, to form a correct diagnosis—to determine whether complete anchylosis has taken place, or whether the adhesions are fibrous; and if fibrous, whether they will yield to gradual extension or not. If these several points cannot be otherwise determined, chloroform should be fully administered, so that when muscular relaxation has been obtained, both the character of the adhesions and the amount of motion may be ascertained. When bony union has taken place, a sense of solidity and continuity of structure is communicated to the hands on grasping the limb above and below the articulation; but when fibrous union has formed, there is always more or less motion to be obtained. And if the adhesions are of such a character—so firm and unyielding, allowing of only slight motion, and with inconsiderable muscular retraction—that the normal position of the limb can only be gained by the forcible rupture of the adhesions, the force should be so applied that it is used mainly, if not entirely, in flexion of the limb.

Any tendons which are rigid should be first divided, and the punctures having healed, and chloroform having been fully administered, the limb to be operated on should be so firmly fixed that all motion is prevented, except that which the operator is about to impart to the limb. Thus, for instance, if the hip joint is to be operated on, the pelvis must be fixed; if the knee, the thigh must be securely held; and so on. When the limbs are thus firmly secured, the adhesions are to be instantaneously ruptured, by force applied in the direction of flexion. I say that the adhesions are instantaneously ruptured, when the patient is properly prepared, and the force is rightly adjusted. The limb is then to be bandaged, and the joint i sto be confined either in a gutta-percha splint or in a flexible splint.

I know of no danger whatever from the use of force so applied. Indeed, when the influence of the muscles is perfectly removed, the adhesions themselves usually offer very little resistance; and if the power to be applied is sufficient for the purpose, the result is instantaneous. In a small number of instances, the hand alone is insufficient to rupture the adhesions readily; in these I make use of an instrument of great power to flex the limb. Not only is there no danger connected with this operation, but with moderate care it would seem to be impossible to set up unhealthy action. There are timid people who would persuade you that in these operations fracture is not uncommon; that inflammation is frequently excited; and they will proceed to detail a list of ills, with which I will not trouble you. Let it be sufficient for me to say that I have never seen a fracture produced, nor have I known inflammation to occur, nor any other ill whatever to follow an operation of

this nature; and that when disaster ensues it is from abuse of the operation. I cannot tell what might be the result of adopting such instructions as the following, which I copy from one of the latest works on the subject. After describing the preliminaries of the operation, the author proceeds thus: "A cracking noise is heard, which becomes more and more evident as the movements are continued, and at the end, it may be, of *half an hour*, the adhesions may have so far given way as to allow of motion in all directions to a very considerable extent, in a joint which had appeared completely anchylosed." I say this is not the manner in which this operation ought to be performed. It is capable of abuse, just as is any other operation; but when it is performed as I have above described it, I do not know an operation more successful than this is in the whole range of surgery, or one more free from danger.

When the joint retains its normal external form, the adhesions are easily broken down by the hand, when the limb is properly placed in position, and the full effect of chloroform has been obtained; as you have seen in cases not alone under my care, but I believe also under the care of every surgeon of the hospital. I will especially refer, however, to one of the latest cases which has come under treatment in the hospital—namely that of Mary C., in Princess's ward. This patient had suffered from rheumatic inflammation, and was admitted into the hospital with partial anchylosis of the knee and of the ankle. The tendo Achillis was divided, and, when the puncture had healed, the adhesions were ruptured by flexing the foot upon the leg. On a subsequent occasion the hamstrings were divided subcutaneously, and, the punctures having healed, the adhesions at the knee-joint were ruptured by flexing the leg upon the thigh. This patient walked well when she left the hospital, and without the least lameness; and the knee and ankle of the affected side were as free as those which had not required operation.

It is a point to remember, that after dividing the tendons, and before the punctures have healed, the adhesions should not be ruptured; or they should be ruptured only with great care, lest the puncture should be extended into a rent. This extension of the puncture is much easier to effect than might be supposed, and it is therefore safer to allow the punctures to close before any force is employed.—*Lancet, Feb.* 6, 1869, *p.* 181.

51.—ON A CASE OF SUBPERIOSTEAL EXCISION OF THE ELBOW.

By T. Holmes, Esq., Surgeon to St. George's Hospital.

[The fact of the reproduction of considerable portions of bone, when the periosteum which covered the original bone has been left entire, is established by cases published by Langenbeck and Mr. Joseph Bell. In the great work of M. Ollier an account is given of all (except the most recent) cases in which such reproduction has been ascertained.]

Upon the strength of these authorities, let us assume, then, that if the whole thickness of a bone be dissected out of its periosteal sheath, there is, under favourable circumstances, a probability of its reproduction—between limits which our present experience is as yet insufficient to point out:—can this fact be used in any way to improve the results of excision of the joints? I will only speak of the subperiosteal excision of the elbow-joint, because this is the only operation of the kind of which I have had personal experience; and also because there are far larger and more trustworthy data in surgical literature for forming an opinion as to the value of this, than of any of the other subperiosteal excisions.

I will, in the first place, present to you my patient, and read extracts from the notes of the case:—

The patient, a boy aged 12, was admitted October 14, three weeks after an accident, in which the joint had been laid open by the point of a pair of scissors, which ran in between the external condyle and the head of the radius. Soon after his admission, the head of the radius separated from its

shaft and came away; and as a considerable portion of the humerus was still bare, and there was great pain, suppuration, and loss of motion, the joint was excised subperiosteally on November 19, the humerus being removed above the condyles and the ulna, just through the coronoid process. The radius was not interfered with. The periosteum separated easily from the bones. A slight accident occurred in passing the chain-saw round the humerus, but its section was easily accomplished with an ordinary key hole-saw. Its structure was much condensed by inflammation.

All went on well after the operation. At the date of this lecture, January 13, 1869, eight weeks after the operation, the wounds were entirely healed; passive motion could be accomplished through about 30°; the child could carry the hand to the mouth and head, but had gained little voluntary power, though this was then daily improving. There was a great deal of thickening around the end of the humerus.

The operation is simple enough. The incision which most surgeons now generally use will serve, viz., a single longitudinal cut running between the olecranon and outer condyle. The surgeon has at hand a number of "raspatories" or chisels of various shapes—some with blunt, others with sharp edges; and it is well, in order to avoid loss of time in an operation, to have the handles of the sharp and blunt raspatories made differently. Having cut down quite freely on to the olecranon, and divided the periosteum covering it, the operator proceeds to detach the membrane carefully from the bone, taking care to proceed slowly, and not to use such violence as may lacerate the periosteum. The triceps tendon is also separated by keeping the edge of the sharp raspatory (or "detache-tendon," as Ollier calls it) carefully applied to the point of the process, while directing the instrument at right angles with it. Having thus cleaned the olecranon, the surgeon proceeds to deal in the same way with the back of the humerus, and the common tendons springing from its condyles. The ulnar nerve is, of course, raised up with the other soft parts covering the inner condyle, and will not usually be seen. When the back of the humerus has been satisfactorily cleaned, the chain-saw is to be carried between its front surface and the periosteum. This is accomplished by pushing the curved raspatory, which I show you here, between the periosteum and the bone. You will see that this raspatory is deeply grooved, and that it has a sort of eye near its end. In this eye is threaded a ligature attached to the chain-saw, and thus the chain-saw is drawn up the groove of the raspatory, and lodged between the periosteum and bone. After the humerus has been divided it is to be seized with the lion-forceps, tilted backwards, and cleaned from the periosteum which coats its anterior face. The coronoid process will then be fully exposed, and should be carefully cleaned from the periosteum and tendon.

I have practised this operation on the dead subject often enough to have assured myself that in ordinary circumstances it is quite feasible. Huëter says, however, that in Langenbeck's experience several cases have been met with where the periosteum was not separable from the bone. In such cases, no harm has been done beyond the loss of a minute or two, and the operation can be finished in the common way.

The main advantage claimed for the subperiosteal operation is that the joint may be regenerated, and thus a more useful and more powerful arm be obtained. The reality of such reproduction is attested by the assertions of numerous operators, that after excision has been practised in this method they have distinctly felt the olecranon and condyles of the humerus reproduced. This is a matter on which a surgeon of experience can hardly be deceived; but it is of course more satisfactory to have the dissection of the parts; and this conclusive proof has now been furnished by a case published by Dr. Doutrelepont in the last number of Langenbeck's "Archiv." Bd. ix. p. 911. In this case subperiosteal excision of the elbow was performed at the age of 18, about four years before death. Two-thirds of an inch of the humerus was removed, the section running through the condyles; the olecranon and coronoid process of the ulna ($1\frac{1}{3}$ inches) and the head of the radius were also removed. The drawings attached to Dr. Doutrelepont's

paper show that the condyles of the humerus had been entirely reproduced—the internal condyle rather exuberantly, so as to form a deep groove for the ulnar nerve. The olecranon was also reproduced, and was both longer and more curved than in the natural state—a circumstance to which I must recur hereafter. The head of the radius was also reproduced, and was united to the ulna by an orbicular ligament as in the natural joint. There was a regular joint between the ulna and humerus (an articular surface, surrounded by a capsule, being formed on the summit of the reproduced sigmoid notch), and true hyaline cartilage had also been reproduced. There was no appreciable shortening of the arm, and the muscles were as well developed on that side as on the other. Pronation and supination were almost natural: and flexion and extension were perfectly good, but within the limits of 75° to 120° only.

This case is a perfectly conclusive proof of the reality of reproduction of the bones, and of the formation of a true articulation (with cartilage and capsule complete) after the operation in question.—*Practitioner*, *Feb.* 1869, *p.* 65.

52—ON THE REDUCTION OF OLD DISLOCATIONS;

By Bernard E. Brodhurst, Esq., Assistant Surgeon to St. George's Hospital.

[It was laid down as a rule by Sir Astley Cooper, that in dislocations of the hip, attempts at reduction should not be made after eight weeks of displacement, and in those of the shoulder after three months. The use of chloroform, however, compels us to re-consider and modify our opinions on such questions as these.]

The mode in which reduction of an old dislocation should be proceeded with, that the operation may have a successful issue, is of great importance. I will relate two cases as examples of successful reductions of long-standing dislocations, which will together illustrate perhaps every point that it is necessary to consider.

It is doubtful if the capsule is ever an obstacle to the return of the dislocated bone. Certainly the altered shape of the head of the bone never can prevent the return of the head to its articular cavity. And it is probable that where the articular cavity is partially obliterated, it is the result of extraordinary violence and consequent inflammation. I have found the cotyloid cavity retaining its depth and covered with cartilage after the head of the femur had been dislocated for three years. And Fournier has placed a dissection on record where the head of the femur had been dislocated during thirteen years, and in which the acetabulum retained its form and depth and cartilage.

Chloroform having been fully administered, the adhesions around the extremity of the bone are to be ruptured by free movements of the limb, and these having been separated, the dislocated bone will be replaced by traction and manipulation, and without extension and the use of pulleys. In some cases it is necessary to have recourse to the subcutaneous section of tendons before proceeding to reduce the dislocation; and when this is done, the punctures should be allowed to heal before attempts at reduction are made.

Sometime ago, I saw, with Mr. Chalk, a patient, fifty-three years of age, who had fallen from a height of twenty feet and dislocated the humerus beneath the pectoral muscle. The swelling was considerable at the time, so that the dislocation was not discovered by the surgeon who first saw this patient; but afterwards, an attempt at reduction was made, which, however, was not successful. Four months later, he presented himself at a large metropolitan hospital, that an attempt at reduction might be made. He was persuaded, however, not to submit to any attempt to replace the head of the bone. Two months after this, I saw him. He was suffering acutely, and was unable to move the limb, or to carry it without support. Any attempt at motion caused excessive pain, especially about the neck of the humerus and in the region of the elbow.

The head of the humerus could be distinctly felt lying beneath the pectoral muscle, where it appeared to be firmly fixed. The deltoid, biceps, and pectoral muscles especially were atrophied; but also the whole limb was wasted. The fingers were numb. The elbow was somewhat removed from the side, and was inclined backwards, where it was fixed and immovable; the forearm was flexed, and the hand was carried forwards.

Under these circumstances, we determined to endeavour to replace the head of the bone; and although the humerus had been dislocated now for 175 days, we considered ourselves justified in making the attempt at reduction. The patient was therefore placed completely under the influence of chloroform, and the scapula was firmly fixed both laterally and from above. The adhesions about the head of the humerus were then broken up by to and fro motions of the humerus and by freely rotating the head of the bone. Then seizing the wrist, I drew the arm directly upwards, when the head of the humerus immediately slipped into the glenoid cavity with a slight click. A pad was placed in the axilla, and the arm was bandaged to the side. The patient remained in bed for three days, and on the sixth day the bandages were discontinued, and gentle motion was commenced. There was no disposition at any time for the bone again to become displaced.

After some considerable time, the power of motion was in great measure, if not entirely, restored; pain and numbness ceased, and there was no difference in the fulness of the two shoulders; so that when I last saw him, this arm was almost as useful as the other.

On the 8th of July, 1868, Elizabeth Costin, nineteen years of age, was admitted into the hospital with an old dislocation of the wrist forwards. This dislocation resulted from a fall on to the palmar surface of the extended fingers, and it occurred six years before her admission into the hospital. The wrist and fingers had entirely lost all power of motion. On the day after her admission into the hospital, the flexor tendons, namely those of flexor carpi radialis, palmaris longus, flexor sublimis, and flexor carpi ulnaris, were divided subcutaneously; and four or five days later, the punctures having healed, chloroform was administered, the adhesions were ruptured, and the hand was restored to its normal position by flexing and subsequently extending the hand upon the forearm. The limb was then laid upon a straight splint and bandaged firmly to it. After some few days passive motion was commenced, and for this purpose an instrument was constructed with a joint corresponding to the wrist-joint, which supported the extremities of the radius and ulna and the carpus, and which allowed of motion without displacement of the wrist.

In old dislocations, then, recourse is to be had to manipulations, with or without the previous subcutaneous sections of tendons, rather than to the pulleys and violent extension of the limb. Violent extension may occasion rupture of vessels and nerves, as well as of the integument and the muscles; it may even occasion fracture. But these accidents cannot occur when manipulations are employed to restore the limb after the adhesions have been ruptured. When, as in the cases now related, there has been little or no attempt at repair, and where the limb remains not only motionless but painful, recourse may be had, even at a very late period, to the means above detailed to restore the position of parts and the motion of the joint.—*St. George's Hospital Reports, Vol.* 3, 1868, *p.* 70.

53.—ON THE REPRODUCTION OF BONE.

By M. L. Ollier, Surgeon-in-chief of l'Hôtel-Dieu de Lyon.

[We have appended M. Ollier's name to this article, though it is in fact a review of several other works besides that of M. Ollier. M. Ollier made the following experiment to determine the true function of the periosteum.]

A flap of periosteum was dissected from the surface of a bone, but not completely detached. The free end of the flap was then passed around the mus-

cles in the neighbourhood and brought close up to the end which remained attached to the bone. It was fixed by suture to the skin to prevent retraction. The outer wound was then closed. Of the first experiment described, which was performed on the tibia of a young rabbit the following was the result:—Some little swelling of the limb succeeded the operation; within a week the periosteal flap could be felt increased in size and consistence, and within a fortnight already hardened. In six weeks the animal was killed, and, on examination, it was found that the periosteal fibrous ring had become a bony one, fixed to the tibia by one end and free at the other. The new bone looked normal; it was surrounded by periosteum, and had a smooth and compact surface. On section, the interior looked as if it were becoming hollowed out. Under the microscope the ordinary characters of bone-tissue were discovered.

The periosteum of all bones and of all parts of a bone does not ossify with equal readiness. That of the long bones is better for this purpose than that of the flat; and of the former, that belonging to the shaft near its junction with the epiphysis is better than that upon any other portion of the bone. It is least good for transplantation where the muscular fibres are inserted upon it, being here much thinner than elsewhere.

Having proved the importance of the periosteum in the process of ossification, M. Ollier tested its utmost power by removing whole bones, first carefully dissecting off their periosteum, and, as far as possible, leaving the connections of the latter with surrounding parts uninjured. After this fashion the radius and other bones were operated on with success, tolerably complete regeneration taking place in many cases. No reproduction occurred when the periosteum was removed with the bone.

After the consideration of subperiosteal resections of bones, the author proceeds to describe his experiments on the excision of joints, and dilates at some length on the advantage of preserving, as far as possible, in these operations the integrity of the periosteum and ligaments which surround the articular ends of the bones. Cases of resection of the joints of young animals are then given. The results were extremely good, the general shape and appearance of the bones being well reproduced. As an instance we may quote the case of a young dog, five or six months old, from which the elbow-joint was completely removed by the subperiosteal method, together with a third of the shaft of the humerus and a considerable portion of the upper ends of the radius and ulna. The dog was killed two and a half months after the operation. On examining the joint it was found that a well-marked trochlea had been reproduced. There were also two well-marked and partly ossified condyles with a distinct and deep intercondyloid fossa. The bones of the fore-arm had been somewhat drawn back by the triceps. The new olecranon was more curved than the old one, and the ossification had extended a little into the tendon of the triceps. The extremity of the radius was surrounded by fibrous tissue incorporated with the capsule; its articular cup was not reproduced. The articular surfaces of the bones were joined together by a thick capsule in which were found strong lateral ligaments. The muscles had preserved their normal attachments. The movements of flexion and extension were re-established, the latter rather limited by the too great curvature of the new olecranon. The paw was flexed on the fore-arm by the retraction of the flexor muscles.

An instance of excision of the knee-joint, also in a dog, is related; and if the amount of bone removed be taken into consideration the result must be considered very good. About the same results were obtained after excisions of the articular and arthrodial joints. All these experiments were performed on young animals. In older subjects less successful results were obtained; but even in these the subperiosteal method was proved to be incontestably superior. In all cases, old and young, removal of the periosteum with the bone was followed by little or no regeneration.

In some experiments on the growth of bones, M. Ollier proved that increase in length takes place in the arm bones chiefly at the upper extremity of the humerus and the lower ends of the radius and ulna; while the opposite

occurs in the leg. This, as the author observes, is not a mere re-statement of the fact that the epiphyses of the bones of the arm and fore-arm are joined to the diaphyses sooner at the ends of the latter nearest the elbow than at the other, while the reverse holds good for the bones of the leg. For the increased growth takes place before either of the epiphyses has become united to the diaphysis; and, moreover, the times of normal junction of these are not sufficiently distant, one from the other, to account for more than a very small increase at one extremity above that which occurs at the other. The two facts, however, go together. Where the union of epiphysis with shaft is quickest, there is also the least contribution to the growth of the bone. In man, also, as Berard has noticed, there is another fact to be placed with these two,—that the nutrient canal is directed towards the end of the bone at which are the quickest completion of ossification and the least growth. Although, however, this last fact is true in man, its connection with the other two points to which reference has been made is a mere accident, and in no sense physiologically related to them. In the rabbit the nutrient canal of both femur and humerus are directed downwards, but the law of ossification and growth in these bones is the same as in man.

As may be gathered from his experiments on the lower animals, M. Ollier is a strenuous advocate for subperiosteal resections, not only as against resections, performed in the ordinary manner, but in contra-distinction to another operation of the kind, '*évidement*,' the supporters of which, headed by M. Sedillot, claim for it all the advantages of M. Ollier's operation, with freedom from many of its perils.

The operation of *évidement* is no new one. There is scarcely any more ancient. Essentially it consists in scooping away all the diseased parts of a bone so as to leave a cavity with healthy bony walls, and has been practised by surgeons from Celsus downwards. M. Sedillot has, however, employed the method in many cases in which the majority of surgeons would have resected or amputated the diseased bone. His object has been the same as M. Ollier's, namely, to make use of the periosteum as a means of regenerating lost bone. But while M. Ollier dissects off the periosteum by itself as completely as possible from the underlying bone, M. Sedillot scoops away the bone from within, and leaves of it only a thin shell to support the periosteum, to which, and not to the shell of bone, he gives the credit of the regeneration which takes place. He claims, therefore, for this operation the same purpose or intention as that of M. Ollier, with a better means of carrying it into effect. M. Ollier denies both statements. He believes that the regeneration which follows *évidement* is due to the bony shell which is left; and that the latter is not, as his opponent in argument believes, a mere temporary mould destined to disappear when the periosteum has reproduced sufficient new bone to enable it to dispense with its services. He denies, too, emphatically, that *évidement* is for all or even the majority of cases so good an operation as subperiosteal resection; and although he admits, with all other surgeons, that excellent results are often obtained by its means, especially in chronic inflammatory conditions of the shafts of bones or of their epiphyses when there is no communication with the neighbouring joint, he is a very decided opponent of the operation of scooping out the articular extremities of the bones of a large joint.

Having thus disposed of the rival operation of *évidement*, M. Ollier proceeds to relate his clinical experience of the value of subperiosteal resections; and to silence all doubts respecting the true regeneration of bone after operations of this kind, he relates a case of excision of the upper end of the humerus. The case has been previously published, but it will be well to trace briefly its main outlines. It was that of a girl, fifteen years old, from whom M. Ollier removed the upper half of the humerus on account of chronic inflammatory disease, not, he specially adds, necrosis. The periosteum was carefully preserved in the operation and dissected, where still adherent, from the subjacent bone. The ligaments and tendons were also dissected from the head of the bone without cutting them, and the upper part of the bone being thus stripped completely naked was sawn off. In this way

a periosteal and ligamentous sheath was left tolerably complete. The patient had a long and chequered convalescence, but at last recovered well with reproduction of bone within and from the periosteal sheath. The proof of this last statement, namely, that the regenerated bone was produced from the periosteum and not from the cut extremity of the old bone, lay chiefly in the fact that during convalescence there was for some time mobility of the upper and new piece of the humerus on the lower and old part, which could not have happened had the new bone been developed continuously with the old. The movements of the shoulder-joint were fairly restored, and although no new head to the humerus could ever be felt, there was evidently the restoration of a scapulo-humeral joint of the same type as the original. For, adds M. Ollier, not only were the chief movements restored, but the humerus could be rotated on its own axis, and the deltoid separated the elbow from the trunk to a distance of six inches. To objectors to subperiosteal resections on the score of the difficulty of separating the periosteum from the bone the author points out that the membrane is thicker and less adherent in young subjects than old, and thicker and less adherent in inflamed than in healthy bone.

The next portion of M. Ollier's work is devoted to the consideration of the best method of performing the operation, and he lays especial stress on the advisability of cutting neither muscle nor tendon; and if the former be divided of necessity its nerve should be carefully avoided. By thus operating carefully, the tendons are left with their attachments to the periosteum, uninjured; and, in resections of joints, there remains an almost uninterrupted fibrous *loge* formed by periosteum, tendons, ligaments, and capsule, to which the muscles preserve their proper attachments. Other practical instructions are given by the author, and will well repay perusal. The following are his general rules for the operation as performed on the joints:

1. A single straight or sinuous incision through the skin in the direction of the long axis of the limb. If absolutely necessary, incisions perpendicular to the main one must be made.
2. A single straight incision of the capsule.
3. The ends of the bones should be dislocated before being sawn, in almost all cases but those of the wrist and ankle.
4. If the condition of the bones beyond the line of section require it, the gouge may be used; but *évidement* should not be practised before resection.
5. The resected bones should be kept extended unless when a bony anchylosis is required. The degree of extension must be in proportion to the expectation of regeneration.

Special instructions are also given by the author for the resection of each joint.

M. Ollier's favourite instrument is one which he has named the "Sonde-rugine," and which is a long gouge, curved so as to allow of its being used as a protection to the periosteum after it has separated it from the bone. It is pierced at its extremity, so as to serve for carrying a chain-saw around the bone after the separation of the periosteum. For cutting the bone he prefers the bone-forceps when practicable and the chain-saw when a saw is absolutely necessary; the great object being to divide the bone with as little difficulty as possible, and to avoid all disturbance, especially of the periosteum, beyond the line at which the section is to be made.

With the operation of subperiosteal resection, the use of nitrate of silver or the actual cautery may be combined, when fungous granulations or fistulous tracks seem to render either of them necessary.

The degree of extension to be kept up after the operation depends on the chance of a good result. In a young subject, for instance, with a tolerably healthy state of the bone, much more regeneration may, of course, be expected than in the presence of the opposite conditions, and therefore more extension may be safely applied.

[M. SEDILLOT, of Strasburg, says:]

Subperiosteal resections should be rejected as illogical, inefficacious, and

dangerous:—"We maintain that the periosteum completely separated from the bone beneath, whether it be left in its place or taken to another part of the body, as a sheath or flap, will be of no service to surgery as the means and organ of regeneration of bones." And many other sentences of the same kind might be quoted. Referring to M. Ollier's experiments on the lower animals, he remarks that curious as they are physiologically, they are useless to surgery.

[M. Sedillot's favourite operation is that of *évidement* or gouging out the diseased portion of bone.]

Theoretically, M. Sedillot's position is a good one. "The first indication is to avoid the sacrifice of any healthy part of the skeleton, since this portion, clothed by its periosteum, is the most efficacious and certain means of reproducing the whole of the bone. Such is the foundation of our method of *évidement*, and our gravest objection to subperiosteal resection." Like his opponent, he refers to the benefit derivable from leaving unharmed the connections of the periosteum with the parts around. So far, of course, the author is justified in holding his own; but in the face of M. Ollier's cases, as well as those of others, the following sentence is rather inexplicable:—"What has happened to the partisans of subperiosteal resections? They have taken away the bone. The periosteum, unsupported, becomes shrunken, and is folded by the contraction of the muscles; it inflames and suppurates. In the majority of cases the limb is shortened and deformed with no production of new bone."

Some experiments on young dogs, to test the degree of repair possible after gouging out the interior of bones, and leaving only a thin layer in contact with the periosteum, were undertaken by M. Sedillot, and followed by good results:—"Les évidements des diaphyses et des extrémités des os sans destruction des lames osseuses periphériques et par conséquent sans pénétration dans les jointures, ont toujours réussi."

The cases of disease in which *évidement* is useful and practicable, according to M. Sedillot, are chronic inflammations of bone, tubercular disease of the articular extremities, fibrous, vascular, encysted, and certain limited enchondromatous tumours. The operation, too, may be employed as an assistant to articular resections, and by its means much less bone is required to be removed. The operation itself, as we have said before, resembles very nearly that undertaken so frequently by almost all surgeons for the removal of carious bone, but involves more methodical dissection of the periosteum than is common in this country; and the gouge is especially employed so as to leave only a thin shell of bone immediately within and supporting the periosteum.

A large part of M. Sedillot's work is occupied by the relation of instances in which the foregoing operation has been employed by himself or others. The difference, however, between his method and that of other surgeons is not so great that we can afford space for quoting from his cases. It seems to us rather that these operations should be classed with the ordinary gouge operations, and the two compared with subperiosteal resections as performed by M. Ollier and others.

Dr. Stokes's paper on "Periosteal Preservation in Operative Surgery" is probably fresh in the memory of most of our readers. It is a very good and practical *résumé* of his own personal experience on the subject. He is an earnest supporter of Professor Syme and Langenbeck and M. Ollier; and, indeed, his attention was specially directed to this subject during attendance on the cliniques of the two last-named surgeons.

The two following cases may be quoted from Dr. Stokes's experience in this matter; and he relates several others.

"The first of these operations was performed on a girl aged 12, of delicate habit, who was under my care in the autumn of 1864, and who suffered from strumous disease in her left elbow-joint. The patient stated that, four months previous to her admission into hospital, she received a fall in which the elbow was struck against the ground with great violence. After falling, the patient suffered severe pain in the joint; it swelled greatly; and she found it im-

possible to extend or 'stretch' it, to use the patient's own expression. The inability of extension of the arm remained a permanent condition. Three months after the accident, the patient was admitted into my wards in the hospital. I found the arm forcibly flexed; extension was impossible. The soft parts about the joint were swollen and puffy, so that it was quite impossible to determine whether the original injury was an epiphysary disjunction, which the age of the patient rendered probable, or a simple luxation. There were three or four sinuses, situated over and in the immediate vicinity of the internal condyle; and, on introducing a probe into any one of these, the existence of soft diseased bone could be readily determined. I accordingly performed the operation, adopting the long vertical incision, carrying it over the ulnar side of the olecranon, and, taking especial care not to divide the triceps tendon, proceeded to raise the periosteal envelope by means of the various formed raspatories devised for the purpose. The elevation of the periosteum was not attended with any great difficulty, and the remaining steps of the operation were then completed in the ordinary manner. The limb was afterwards put up in a gypsum bandage, and kept in a continual bath for four weeks. After this, the wound being all but healed, gradual flexion and extension were commenced. Three months and a half after the operation, the power and flexion and extension of the joint was almost perfect; and now, at a period of little more than three years after the operation, during which period there has not been the slightest evidence of a reappearance of the disease, the patient enjoys every motion that the healthy joint possesses, perfect power of flexion, extension, pronation, and supination; and what bears more directly on the immediate subject of this communication, there is a most obvious osseous re-formation, not only of the condyles, but also of the olecranon. This re-formation of the olecranon has also been frequently observed by Langenbeck, and also by Huctor, one of his former assistants."

The other case which we shall quote from Dr. Stokes's paper also, as he remarks, affords a striking illustration of the osteogenetic properties of periosteum, and, consequently, of the great practical importance of preserving it in resections.

"The patient, a young woman, about 19 years of age, suffered from suppurative osteitis of the right ulna, the result of a severe blow. A free incision was made down to the bones; and over this, which I found extensively diseased, the periosteum was much thickened. Having divided the membrane by one of Nélaton's so-called periosteal knives, I then detached it by means of raspatories from off each side of the bone. The diseased portion of bone, about two and a half inches in length, was then removed by small resection-saws. Three months after the operation, the wound was completely healed. New bone had formed throughout, and the patient was enabled to return to her employment, which was that of a house-servant."

Dr. Stokes has also practised with success M. Ollier's operation for the restoration of the bone by including in his flap periosteum from the frontal bone. The case was one of a young man whose nasal bones had been completely destroyed by lupus. "About fifteen months after the operation, I inserted in two different situations in the nose the so-called "entomologist" pins down to the newly-formed bone, and satisfied myself and others present, beyond all doubt, as to its existence."—*British and Foreign Medico-Chirurgical Review, April*, 1869, *p.* 334.

54.—ON THE TREATMENT OF FRACTURES OF THE LEG.

By James Paget, Esq., F. R. S., Surgeon to St. Bartholomew's Hospital.

[All the cases of fracture referred to in the following clinical lecture were admitted into the hospital within a period of one week, in consequence of the occurrence of what is known as boxing night at the London theatres.]

All these fractures that I have mentioned were put up at once. That is the custom which we adopt here. I think that, as you watch fractures, you will find that there are very few instances indeed in which you need depart from this rule—very few in which the damage done is such as to make it at all advisable to leave the fracture for a time, imperfectly at rest, on a pillow for any supposed righting of the fragments, diminution of swelling, or other supposed change for the better. I do not say that there are no such cases; each case is to be judged upon its own special grounds; but you may always begin the treatment of a fracture with a strong prejudice in favour of putting it up at once.

With regard to the manner of putting up a fracture, you will always have your choice of what is called the immovable apparatus, with gutta percha, and starched bandage, or gum and chalk, or what I more commonly use, plaster of Paris. There is no question of the considerable advantage of these in the commonest and simplest forms of fracture of the lower or upper extremity; yet I think that this apparatus should be used among out-patients only when you can be sure that the patient possesses sobriety and intelligence enough, and home comfort enough, to be able to manage his apparatus in some measure for himself. And the security of putting up fractures with splints and suspending them, as we do here, is so much greater, that if we have to admit the patients into the hospital, and to keep them here, we always adopt this plan first, except in the very simplest form of fracture of the leg. It is of this manner that I am now going to speak to you—the manner in which, in my wards, we put up fractures of the leg, whether of tibia and fibula, or of either bone alone.

Here is the apparatus, the principal thing about which I take to be this back splint. As you look at that and compare it with the back splints commonly made, you will see first that it is narrower than they are; so that for a man of full size the splint is not usually, at its widest, more than three and a half inches wide. It is narrowest about the ankle, where it is two and a half inches wide, and beyond which there is a large opening in it for the heel. Moreover you see the splint is nearly flat transversely; it is not hollowed out, as it is supposed it should be, to fit the back of the limb. Then it is very little curved; so little curved that you will say that it could not fit the leg of a very robust man. The calf, you would say, could never rest on that. But you must remember that you want a splint that is to fit the leg, not only at the time of admission, but also, and much more, the leg as it will be some ten days or a fortnight afterwards, when the leg has begun to waste, when the calf has fallen flat—gone to nothing. On a very curved splint, one that fitted the leg in the first instance, there will be no comfort after the lapse of a week, when the leg begins to waste. This splint is perfectly simple in its structure, a long and nearly flat piece of iron, bent at a right angle for the foot, and having two short transverse bars projected from its sides and looped to receive the slings. I would have you observe the direction of the foot-piece, which is simply turned up from the back-piece of the splint, and turned to very nearly a right angle with the line of the back part, quite straight, narrow, and perfectly simple. On that arrangement of the foot-piece depends mainly the arrangement of the limb.

Besides this there are these two flat, wooden side-splints, duly padded like the back splint, and with care taken that they should be sufficiently long for the ends to project a little beyond the foot-piece of the back-splint, and to reach to some three or four inches above the patella. They should, moreover, always be broad enough to enable the straps that are put round them completely to encompass them without touching the leg. It is important for the comfort of the patient that no strap should come in contact with the front of his leg, and, after all, however one may regard anatomical considerations in putting up a fracture, the one most essential idea is that of comfort. If the patient is so disquieted by any of his apparatus that he cannot lie well or sleep well, the good progress of the fracture is a thing hardly possible; and great disquietude is produced by straps, bandages, or cutting edges of any kind which come in contact with any part of the skin.

The rest of the apparatus consists simply of pads stuffed with tow, one for each splint; and of the means, which I will presently speak of, for securing the foot to the foot-piece, and the knee to the back-splint; and then besides, the simple cradle that we have, with the double bar on the top for suspension by the loops of the transverse bars fixed to the back-splint. There is also a prolonged piece of iron from the distal end of the cradle to secure that the bed-clothes shall in no case touch the foot-piece or any part of the apparatus, or the patient's leg.

Then observe how the patient's leg is set upon this back-splint. I do not speak of the manner of reducing the fracture; that must depend on the considerations that I spoke of the other day. The limb having been put into a right position, it is simply laid on the back-splint, with no additional pad beyond that which is fastened to the splint itself, unless in some cases where there is a great hollow above the os calcis, and then it is very useful to have a pad under the tendo Achillis—an additional pad to that with which the splint itself is covered. But the chief thing is the fixing the foot to the foot-piece.

You will observe, if you examine fractures of the leg that have united badly, that there is not one way, but several, in which the leg may be spoiled. First of all there is shortening. That comes, generally speaking, either from the fracture being so oblique that it is hardly possible to prevent one portion of the bone from sliding on the other, or from insufficient extension having been used at the time of setting. But there are other distortions which are really worse than shortening, for shortening can be corrected by adding something to the sole of the boot or shoe. A worse distortion than this is when the foot is rotated outwards, so that when the man gets up from what is supposed to be the cure of the fracture, he walks with the toe of the fractured limb not directed forwards like the other, but rotated outwards, a position in which firmness of support is hardly possible. And there is a worse thing than that. It is when the patient rises from the fracture with the sole of the foot either inverted or everted, so that from that time he has to walk, not fairly on the flat of his foot, but on the outer or inner margin of it. It is from want of care in reference to that distortion that fractures of the fibula are sometimes followed by one of the greatest miseries that can result from fracture of the lower extremity; for when a patient is consigned for life to walk on the inner or outer margin of his foot, he loses I know not how large a proportion of the proper strength of his limb, and nearly all the comfort of his walking. He is in the position of a person who has been congenitally deformed, so as to walk on an inverted or everted foot. He is as ill off as those with varus or valgus; nay, he is in a worse condition than they are, because his case, depending as it does upon distortion of the bones, and not of the joints, scarcely admits of repair. No apparatus can put a patient into comfort who rises from fractured fibula or fractured tibia and fibula with this defect.

Take, therefore, the foot-piece of the splint as the guide for the position of the foot; and if you do but see, in the management of fractures of the leg, that the foot of the patient and the foot-piece of the back-splint fairly correspond, it is hardly possible for the limb to fall into any of these defective methods of repair. That correspondence between the axis of the foot and of the foot-piece ensures that there shall be no rotation or version either outwards or inwards. Then, again, you should be careful that the foot touches the foot-piece by the three balls of the sole—the ball of the heel, the ball of the great toe, and the ball of the little toe. If the foot be set against the foot-piece so that these three chief points, upon which in standing or walking it rests, are in exact contact with the foot-piece, or nearly and evenly approximated to it, when the patient rises with the fracture healed they must hold the same position, and he be ready at once to bear his weight upon these three points. For the rest, this upper curved part of the splint must come in contact with the popliteal space, and you will observe that this upper part is very little curved, so that the limb is very little bent at the knee-joint. That is a most important thing to attend to, for if there be too

abrupt an angle at the popliteal space, there is almost sure to be more or less pressure on the popliteal vein, and then consequent œdema of the leg, and the troubles that ensue from that.

When the limb is thus laid upon the back-splint, and the foot accurately adjusted to the foot-piece, it is secured in its position by the apparatus you see here, formed of gutta-percha, with layers of flannel or of old blanket put underneath it. These were adapted by Mr. Vernon at my request when he was my house-surgeon, to correct what I am sure is a source of considerable trouble in the management of fractures of the leg—the pressure consequent upon bandages encircling the limb and constricting it. They produce œdema of the whole limb, above and below the seat of fracture, and that œdema is often fraught with very evil consequences. Look carefully, therefore, to this—that there are no bandages constricting the broken limb. You will see that we never apply a bandage next to the limb, and within the splints. That is a custom of treating fractures which is sometimes adopted, but in which, when splints are used with proper pads, I can see nothing but evil. It serves no purpose to the limb itself by its compression, and it sometimes does considerable mischief by compressing veins when the limb begins to swell. It also conceals the limb from your view; whereas in every fracture that is under treatment you should, as far as possible, see not only the seat of fracture, but all the adjacent parts of the limb, and have these at all times fairly under your inspection.

Then, even when the bandages immediately surrounding the limb are left out, it is not unfrequent to bandage the foot to the foot-piece and the lower part of the back-splint, and to bandage the knee and the adjacent parts to the upper part of the back-splint. But these bandages have, in like manner, a tendency to produce œdema, especially the bandage of the knee; for if you bandage the knee close down upon a firm back-splint, and it has to lie there week after week for five or six weeks together, the result almost certainly is that, by pressure on the popliteal and saphena veins, œdema will ensue below the constricting bandage—œdema at and about the seat of fracture.

Now observe the different sorts of œdema that are apt to ensue in fractures of the leg.

First, there is that general œdema of the leg which comes on from the mere injury; harmless and subsiding of itself when the fracture is put into a proper position. Then there is the œdema which sometimes comes from these encircling bandages—an œdema more full of mischief. Another form is that in which the foot is hung too much below the level of the knee, as it is in the old apparatus sometimes employed of the double-inclined plane, where the knee hangs over an angle, and the foot hanging low down, is sure to become œdematous. And then there is another kind: that œdema which we have been observing of late, which seems to depend almost entirely upon irritation of the veins of the limb by hard edges of bandages, and consequent clotting of the blood in the veins. There is a woman in Lawrence ward who shows this kind of œdema. After the fracture of the leg had been repaired well in the ordinary apparatus, a plaster-of-Paris bandage was put on, and its edge rubbed against a part of her saphena vein. Trivial as it may seem as a cause of so much distress, this is a cause which I have now seen in several cases. At the part irritated, the blood clotted, with pain and tenderness of the vein, and the clot began to gather other clots at both its ends; and so it went on till the greater part of the saphena vein was obstructed by clots, extending by means of this thrombosis, which Mr. Callender has particularly described in our Hospital Reports. One vein after another, in these cases, becomes filled with clot, till at last a firm, solid œdema of all the parts supplied by these veins ensues—an œdema which does no harm, to be sure, to the union of the already repaired fracture, but which disables the patient from the use of the limb for some eight or ten weeks after the fracture has healed.

There are, then, these four kinds of œdema which we find associated with fractures of the lower extremity; but the œdema that I wish to speak of especially is that which results from constricting bandages, whether put next

to the limb, or so as to enclose the limb and hold it down to the foot-piece and the upper part of the splint.

See what mischief this œdema does. First of all, it adds very much to the sufferings of the patient by increasing the weight and tension of the limb, and consequently increasing his restlessness also. But then, if the limb is œdematous, all its nutritive powers are impaired, and I cannot doubt that sometimes the delay of the union of fractures is due to this cause. The proper circulation through the limb is retarded by pressure upon the veins, and the whole process of repair is hindered. But there is another trouble. It is this œdema which adds to the probability of the occurrence of "sore heel," as we have to call it, in the treatment of fractures of the lower extremity. Of all the vexations interrupting the progress of a fracture, this is one of the chief, not only interrupting the progress of the fracture, but very much prolonging the time of the patient's convalescence, when, after recovery from his fracture, he gets up with a slough on his heel, or on the upper part of the os calcis. It is a thing which you should be very careful to avoid. One of the means of avoiding it is, that the back of the splint is perforated by an aperture for allowing the heel to project a little through it, so that the heel does not rest against the mere hard surface of the splint even though guarded with a pad. But another thing is that the heel should be kept from all sources of inflammation and œdema; for it is through these chiefly that the heel has a tendency to slough. If you will watch the different progress of cases of simple and compound fracture, especially of compound fractures followed by acute inflammation of the whole limb, you will see that in the one case the heel has little, while in the other it has more, tendency to slough, even though the manner of putting up be the same. Where there is inflammation, the whole nutritive processes of all the textures of the limb are very much lowered, and that not at the seat of fracture alone, but in every part of its extent. Then the heel, or anything else that is much pressed upon, is likely to slough. So with œdema. The whole nutritive power of the limb is impaired; and the heel, firmly held down, becomes excoriated or sore, and the recovery of the patient is seriously retarded.

In this apparatus, then, you see no constricting bandage encircling the limb at any part. The foot is held to the foot-piece by a layer of gutta-percha, which is placed, while soft and warm, across the whole dorsum of the foot, separated from the skin by a layer of flannel, and coming over the edges of the foot-piece, is fastened there with tape or string. The knee is held in the same manner; a layer of gutta-percha, separated from the skin by flannel, is put over it, passes beyond the edges of the side-splints, and is held in its place by two straps and buckles. Moreover, to avoid the necessity of straps or bandages around the side-splints, these are held together, not only by the gutta-percha and the straps which encircle it, but also by two transverse bands, which buckle across their lower end, and across and beyond the foot-piece. With that apparatus is fulfilled the design of having a limb held steady enough to its back-splint, without any place in which it is encircled by a bandage—without any place therefore in which any constriction is put upon its veins or other textures.

That which may seem to you as the defect of this apparatus is that there is no sufficient provision for the application of a continuous force of extension; and, for all that you see, the two fragments might here ride the one over the other, being so little held, as they may seem to be, by the layers of gutta-percha. But remember how very little there is to displace the fragments of a broken limb when once it has been put fairly into place and put at rest. As I explained to you the other day, the muscular contractions, which are supposed to be the means whereby the fragments of broken bones are displaced, cease after the first three or four days; so that if an apparatus is only so adjusted that it may keep the limb during those days from all risk of muscular contraction, there is no risk of disturbance from this cause afterwards. See in the ward, now, a man who was admitted some weeks ago with fractured patella. On his admission the fragments of the patella were at least an inch apart. The limb was laid simply upon its back, level with

the trunk; and at first it was quite impossible to retain the fragments together, or to bring them nearly into contact. But day after day the muscles, contracted at first, gradually relaxed, and then, of themselves, and with the contraction of the adjacent textures, the two fragments of the patella came closed together—to within, at the most, a quarter of an inch. There is no risk of muscular contraction displacing the fragments of a broken bone at any time after the first three or four days. At least the case would be quite extraordinary, and require very special treatment, where such an accident would occur.—*Lancet, Feb.* 27, 1869, *p.* 287.

55.—ON THE USE OF CARBOLIC ACID IN COMPOUND FRACTURES, WOUNDS, BURNS, AND GUNSHOT WOUNDS.

By Dr. John Rose, Surgeon to the Kidderminster Infirmary.

Having used carbolic acid in numerous cases since its introduction by Professor Lister, F.R.S., I do not hesitate to say that I look upon it as one of the most useful of modern therapeutic agents in surgical practice, and worthy of that distinguished, original, and philosophical surgeon. By its use conservative surgery has been rendered still more conservative, and a vast amount of misery, discomfort, and mutilation avoided. Since its introduction our operations have been less numerous, although accidents from machinery and other causes have been on the increase, and of almost daily occurrence. I observe that the reports from some of the London hospitals have not been quite favourable, and I think it the duty of those connected with public institutions to give it a fair trial, and report accordingly.

In recent wounds our honorary surgeons generally use lint soaked in a liniment of one part of carbolic acid to five of linseed oil. This seems to possess healing, antiseptic, anti-purulent, and even anæsthetic properties in a remarkable degree.

In burns, as Professor Pirrie remarks, "It seems to accelerate the subsidence of local symptoms, to procure rapid and perfect relief from pain, and to promote healing without suppuration."

We have at present under treatment two cases of gunshot wounds—one of the leg, with comminuted fracture of tibia and wound of posterior tibial artery, and the other of the hand, with severe laceration and destruction of soft parts. Both cases are recovering, carbolic acid having acted admirably. I may add that we have tried the carbolic lac plaster as prepared in Glasgow according to the recipe of Mr. Lister, and have found it very useful.—*Lancet, Jan.* 16, 1869, *p.* 89.

56.—ON THE TREATMENT OF VARUS.

By Bernard E. Brodhurst, Esq., Lecturer on Orthopædic Surgery at St. George's Hospital.

The *treatment of varus* should commence within some few weeks of birth. Nothing is gained by delaying the operation; but, on the contrary, through delay more time is required to produce an equally successful result. From one or two months after birth is the time which should be selected for the operation.

In very slight cases the distortion may be removed by bandaging and movements of the limb; such treatment is long, however, and often it is unsatisfactory. In an ordinary case of varus the distortion cannot be removed by such means. With regard to mechanical treatment, Phillips says: "In the first degree of varus in infants, the foot may be restored without the division of tendons, and through the use of an instrument for extension only; but such treatment is both difficult of execution and occupies much time, it is often painful, and it is rarely efficacious. In every case, even the most simple, it is better to divide the tendons."

The tendons which require to be divided in talipes varus are those of the

tibialis posticus and the tibialis anticus muscles, and the tendo Achillis. And in dividing these tendons it is right to remember that, varus being a compound distortion, its removal must be effected by various stages. Thus, inversion of the foot should be first overcome, after the tendons of the tibial muscles have been divided: the distortion is thus reduced to the condition of equinus. In infantile varus the plantar fascia is seldom contracted, or so much contracted as to require division; but when it has to be divided, it should be done before the section of the tendo Achillis is effected.

In dividing the tendon to be operated on, the knife should first be passed well beneath it; and the cutting edge being then turned towards the tendon, this will be divided transversely on extending the limb. Some operators cut down upon the tendon instead of cutting upwards or towards the surface, believing this to be the simpler method. It is a mistaken notion, however, for not only is the mode which I have indicated easier to perform, but effusion of blood is spared by adopting this mode of division of tendons. If not always entirely bloodless, this operation is for the most part so; but it is difficult to avoid wounding vessels when the knife is used to cut down upon a tendon, and frequently under these circumstances the effusion of blood is not inconsiderable.

To divide the tendon of the tibialis posticus muscle, the tenotome should be passed down to the edge of the tibia, at from three-quarters of an inch to one inch above the malleolus, and the sheath of the tendon be opened freely, without enlarging the external puncture. The rounded knife may then be passed into the wound, and, guided by the edge of the bone, it may be directed beneath the tendon. In the adult the tendon being prominent and easily felt, the sharp-pointed knife may be slipped beneath the tendon immediately that the sheath has been opened; but in infants it is safer not to use a pointed knife for the division of the tendon.

The anterior tibial tendon should be divided immediately after the posterior tibial has been divided. The knife should be passed beneath the tendon from without inwards as it passes over the ankle-joint, and the puncture should be made close to the tendon, that the artery may not be divided. Occasionally, the anterior tibial is more tensely contracted than the posterior; in which case it should be divided first.

It is of real importance that the tendons now mentioned—namely, the tibial tendons and the tendo Achillis—should be completely divided, so that the restoration of the shape of the foot should proceed without hindrance. Should the tendon be transfixed, and consequently only in part divided, the treatment would be rendered, at least in a large number of cases, nugatory.

The division of the tendo Achillis has already been spoken of; and it is, therefore, unnecessary again to allude to it. Before, however, this tendon is divided, the mechanical treatment of varus must be undertaken.

After a tendon has been divided subcutaneously, the puncture is immediately to be closed with a morsel of lint, and the limb, having been bandaged, is to be bound to a well-padded, flexible metallic splint. It is a rule which should always be observed to place the limb, after division of the tendons, in the same position as before the operation; consequently, the splint is to be bent to the angle which the distortion represented, and bound on the inner side of the foot. When the punctures have healed—on the third or fourth day—the splint is to be removed, and one similar in kind, but longer, is to be applied on the outer side of the leg and foot. Even though a slight degree of traction alone be employed, it will be found that in the course of three days the foot will have yielded more, perhaps, than could have been expected from the amount of tension which may have been exerted. On replacing the splint the same effect will be produced, until at length the foot is fully everted.

If, in the infant, it is important, as has been already stated, to deal with talipes varus as a compound distortion, and divide the treatment into stages, it is of much greater moment to attend to this injunction when the patient is older; for, should the Achilles tendon be divided before inversion of the foot is removed, it may be impossible to bring the tarsal bones into their normal positions, and to unfold the longitudinal and transverse arches. It is there-

fore the rule not to divide the tendo Achillis, whether in infantile or in adult varus, until the foot has been fully everted. Although rotation of the anterior portion of the foot may only be slight, yet the difficulty of removing it, and replacing the bones in their normal positions, would be greatly increased by dividing the tendo Achillis, and thus destroying the fixed position of the os calcis.

There have been numerous cases of talipes varus lately under treatment in the hospital, varying in age from one month to twenty and more years; and you will have observed that in all the treatment has been essentially the same —differing, however, in this, that the difficulty of removing distortion, increasing for the most part as age increases, requires different appliances for its removal. Many of you also have seen a case of congenital adult varus of forty-eight years, and in which the operation was brought to a successful issue. A straight, well-padded splint, carried to the knee on the outer side of the leg, and extending beyond the foot, is sufficient to remove inversion in a large number of instances of varus; but it is obvious that such an instrument is but ill-adapted to its purpose, and in severe deformity it is entirely inefficient. The instrument to be employed in this as in every case of distortion should be constructed in accordance with the mechanical relations of the parts to which it is to be applied, and the centres of motion should correspond as nearly as possible with the centre of motion of the articulation to be acted on. Scarpa's shoe clearly does not fulfil this desideratum. We have, however, in use in the wards of the hospital instruments for the treatment of varus which have lately been brought to a degree of perfection which was formerly unknown. Their action will be much more easily understood by observation in the wards than by description, and therefore I abstain from any description, but invite you to see them as they are applied in the wards.

The plantar fascia, when contracted, should be divided before the support of the Achilles tendon is removed from the os calcis, whether in infantile or in adult varus; otherwise the longitudinal arch of the foot can scarcely be fully expanded. It is rare, however, that the plantar fascia requires to be divided in the infant; yet occasionally the central portion of the fascia may require division, or the inner band of fascia may alone be contracted. In either case the contracted portion should be fully divided. In the adult the plantar fascia offers a serious impediment to the restoration of the shape of the foot, and always requires to be freely divided.

After the deformity has been removed, active and passive exercises of the limb, together with friction, galvanism, bathing, and other like means, must be employed, until easy if not complete power of motion is gained; for if the shape of the foot alone is restored, and the power to move it is overlooked, the patient will walk, but without elasticity and without motion at the ankle-joint. Then distortion, to a slight extent at least, will recur, and the tendons will again require to be divided. Thus it is that the treatment of talipes varus consists of, in the first place, the removal of the distortion; and secondly, the restoration of the functions of the limb.—*Lancet*, *Dec.* 5, 1868, *p.* 720.

ORGANS OF RESPIRATION.

57.—ON THE TREATMENT OF NASAL POLYPI BY POWDERED TANNIN.

By W. M. Banks, Esq., Liverpool.

The general practitioner is often consulted, at any rate in the first instance, in cases of nasal polypi. Now, if unwilling to perform the operation of evulsion himself, and equally unwilling to hand over his patient to an operating surgeon, I would suggest a trial of a method of destroying them, proposed by Mr. Bryant about a year ago. It is well known that nasal polypi are seldom or never single, and that, after having removed all the larger ones with the forceps or wire noose, there is too often a crop of young ones left

behind, which soon sprout up and involve a second, a third, and often several operations, before they are all got quit of. Mr. Bryant hit upon the happy idea of blowing tannin into the nostrils, after the operation of evulsion, for the purpose of withering up the young succulent gelatinous brood, which remain behind; and in this he was so successful, that he also tried it on the larger ones, and with very marked benefit. During the past year, I have used it in a few cases myself, and in one or two, the effect has been most satisfactory, the polypi having either shrunk away, or actually dropped off, and so the patient has been spared the misery of undergoing a painful and very repulsive operation. A few grains of tannin are simply put into a quill, which is inserted as far as possible into the nostril, and then, with a puff, the powder is blown out over the mucous membrane. This, however, involves the presence of a second person to blow the powder up the nostril. I have found that this can be obviated by having the tannin put into a hollow india-rubber ball, with a short wide nozzle attached to it. A smart compression of the ball sends the powder flying up the nozzle, and so the patient can employ the remedy himself.

These little implements are now sold in all druggists' and surgical instrument makers' shops, for the purpose of giving small injections. The nozzle of course must come out to allow of the powder being poured into the ball, and the tannin itself should be finely pulverised. The successful cases which I had were in young girls, and I should think that the remedy will act best where the polypi are not of very old standing, and seem to be soft and gelatinous.—*Liverpool Med. and Surgical Reports, Oct.* 1868, *p.* 114.

58.—ON THE TREATMENT OF OZÆNA.

By W. M. Banks, Esq., Liverpool.

There are few complaints more distressing than ozæna, which, leaving the patient, as it does, sufficiently well to perform all the ordinary duties of life, is yet a continual source of misery to him—a veritable thorn in the flesh. The blocking up of the nostrils and consequent hindrance to free breathing, the alteration of the voice, the constant discharge of blood and matter and mucus, and hardened inspissated crusts, and above all, the loathsome smell which is an inevitable concomitant of the disease, render the patient a burden to himself and a nuisance to his friends. A very great boon was conferred on such sufferers, by the discovery, made by Weber of Leipzig some forty years ago, that when a column of water is passed along one nostril, the moment it impinges on the soft palate, it causes that structure to rise upwards and completely shut off the nasal from the pharyngeal cavity, thus compelling the fluid to pass round the posterior edge of the nasal septum and emerge by the other nostril.

Another German professor at Halle, also named Weber, was the first to carry the principle into practice, and in 1864, two articles upon the subject, by Dr. Thudichum, appeared in the Lancet, describing an apparatus which he had invented, and which has since gone by his name.

It consists of a heavily-weighted stand, having attached to it, by means of a movable arm, a glass jar, which contains the fluid to be employed. Connected with the bottom of this jar is a flexible tube, fitting at its further extremity with a perforated boxwood nozzle, and provided with a tap to regulate the flow of the liquid. The patient stands or sits with the mouth wide open and the head vertical, not thrown back, as he naturally inclines to do at the first impulse. The nozzle is fitted pretty tightly into one nostril, the tap opened and presently a continuous stream pours out of the other nostril. The force and volume of the stream are increased by elevating the glass vessel on the shaft of the stand, and opening the tap to its full extent, and *vice versâ*. As this instrument is rather a costly one, a very much simpler variety is made by Mr. Reynolds, of St. Anne Street, Liverpool, consisting merely of a white delf jar with the tube screwed into an aperture close to the bottom.

The jar is placed on the top of a table, or any high piece of furniture, and so the necessity for a cambrous stand is done away with. The price of this instrument places it within the reach of almost any one.

Mr. Christopher Heath, however, having recognised the utility of the instrument, and being anxious to put it into the power even of the poorest dispensary patient to provide himself with it, has reduced it to the utmost simplicity, by doing away with the jar and the tap altogether, and merely having about seven or eight feet of india-rubber tubing, armed at one end with the nozzle, and at the other with a perforated leaden weight. An ordinary jug, filled with the requisite medicament, is placed, say, on the top of a chest of drawers, and the weighted end of the tube sunk in it. Into the fluid are then paid about a couple of feet of the tubing, which is next pinched between the finger and thumb, close to the margin of the liquid, and being drawn up over the edge of the jug, a syphon is formed, and the water or the saline solution, as the case may be, flows freely along the tube. By pinching the tube, the volume is diminished at pleasure, thus doing away with the necessity of a brass tap, and so the cost of the instrument is reduced to a few shillings. One great advantage of this form is that, being extremely portable, it can be easily carried about by persons who require to travel, but when there is no such necessity on the part of the patient, the second form is, without doubt much more convenient to manage.

In the using of the instrument there are one or two points to be attended to. In the first place, it should be seen that the nozzle fits the nostril accurately; and secondly, in the case of children or nervous people, the full stream of fluid should not be turned on at first, as, if this is done, they begin to splutter and cry out, the soft palate falls, the fluid runs into the pharynx, and you have the process to begin over again. The fluid should be allowed to run gently through at first, and then its volume and force increased, either by turning on the cock to its full extent or by elevating the reservoir. Also, having let a sufficient supply of fluid run up one nostril, it is advisable to insert the nozzle into the other, and reverse the current, as, by this means, the hardened crusts which have been detached, are much more easily got quit of.

As was pointed out by Dr. Thudichum, pure cold water is irritating to the mucous membrane of the nostrils, much more so than tepid water, or even than a saline solution, while, this last possesses, in a marked degree, the property of dissolving the inspissated mucus, and loosening the hardened crusts. The patient should, therefore, be directed, on first rising in the morning, to run through the nose a pint or two of a solution of common salt in tepid water; about an ounce or more to the pint. This cleanses the mucous membrane, and then either a deodorising or an astringent fluid should follow. The best deodorants are Condy's fluid, the liquor carbonis detergens, and carbolic acid; about a teaspoonful of the two first to a breakfast cup of water is enough to begin with, and about 1 part of carbolic acid to 120 of water. I tried them all successively in one patient, who gave her verdict in favour of the carbolic acid, as affording her most relief. After persevering for some time with the tepid salt and water, followed by deodorants, the mucous membrane gets clean enough to permit of the action of remedies having a permanently curative object. Of course stimulant astringents are what are indicated. The cheapest and most readily obtained is common alum, of which about 2 drachms to the pint is enough, or the sulphates of zinc and copper (from 10 to 30 grains to the pint) may be used. The practitioner, however, may employ his own favourite remedy, whatever it is, provided he follows Dr. Thudichum's advice not to make it too strong at first, as he found that when the nasal cavity is filled with fluid, even although it be very aromatic, the sense of smell is entirely obliterated, and, the reflex effects which substances may exercise being thus absent, the application of very potent (and it might thus happen of *too* potent) remedies is borne without much inconvenience.—*Liverpool Med. and Surgical Reports, Oct.* 1868, *p.* 105.

59.—ON A MODE OF TREATING EPISTAXIS.

By W. M. Banks, Esq., Liverpool.

Plugging is a troublesome and disgusting remedy, and not altogether devoid of risk. Cases are recorded where serious disease of the nose has been set up by portions of the plugging having been retained. I should imagine that a stream of some dilute hæmostatic, passed through the nares, would, in many cases, suffice to stop the bleeding, and so obviate the necessity of adopting severer measures. The following case illustrates the value of the spray producer in such circumstances. It occurred in the practice of Dr. Cregeen, of this town, who has very kindly furnished the following particulars:

In September, 1867, Miss E. M., aged 20, began occasionally to spit blood, having for several months previously suffered at intervals from bleedings at the nose, which, however, were so slight that she never even told her parents about them. She spat up the blood on the slighest exertion, but yet her general health was very fair, she did not emaciate, the menstrual function was regular, and stethoscopic examination revealed no evidence of disease of the lungs; in short, it was difficult to say positively where the blood came from. In the early part of this year she again had some severe attacks of epistaxis, which she said nothing about, for fear of being kept in the house, and "invalided," but one day in March she had an attack, in which such a quantity of blood was lost that syncope ensued. The bleeding recurred thrice in the same day, and, the usual remedies proving useless, her medical attendants plugged the nares very thoroughly. Strange to say, even while the plug was in, she vomited blood, which had evidently been swallowed. The plug was removed and all kinds of styptics were employed, together with rest, proper diet, and internal remedies, such as digitalis, aconite, &c., calculated to moderate the force of the circulation, but in vain. For more than a month she had attacks of epistaxis and vomiting, from two to four times every week, till she became utterly exsanguine, as the quantity of blood lost each time was very great. In the end of April she came under Dr. Cregeen's care, who had her removed to New Brighton, in the hope that the change of air might do good. She was by this time quite blanched, her appetite indifferent, the heart extremely irritable, and she herself so weak that she could not be taken out of the carriage to cross the river, and it had to be taken over in the boat with the patient in it. It was now pretty clear that the blood came from somewhere at the back of the tonsils and *upper part of the pharynx behind the soft palate*, and the difficulty was how to reach this. From some remarks of mine Dr. Cregeen was led to employ the spray, using tincture of perchloride of iron as the styptic. It was applied through the nostrils in the usual way, and seemed to do good, as there was no bleeding for three or four days. Then occurred some slight vomiting of blood, and afterwards, on May 14th, during one of Dr. Cregeen's visits, the patient was seized with an attack of epistaxis so severe that it was with difficulty she rallied from it. The pupils were dilated to their utmost and insensible to light, and the patient became slightly delirious, tossing her arms about and muttering incoherently. The blood which ran from the nose was of the colour of sherry, and so devoid of fibrine that it would hardly coagulate. Dr. Cregeen tried to throw the spray up behind the soft palate, but she could not endure it. It was clear, therefore, that by the usual plan of blowing the spray up one nostril and down the other, the soft palate prevented its reaching the proper place, and, as she could not bear it when applied by the throat Dr. Cregeen adopted the plan of putting the tube up one nostril, closing both the other nostril and the mouth, and then rapidly blowing in about a drachm and a half of the perchloride of iron with the spray producer. The valve action of the soft palate being thus destroyed, the iron reached the very top of the pharynx and ran down, drenching all the surrounding parts; the patient could feel it running down. This was done every day for a fortnight; she did not lose a drop of blood during that time. Dr. C. then began to dilute the perchloride of iron, when, in a day or two she began to hawk up a little blood, and he again resumed the full

strength. The spray was continued till July 22nd, and for some time at first it was noticed that whenever it was discontinued the patient felt symptoms of fulness in the head and throat, which always preceded an attack of bleeding. At the end of that time she was well enough to take carriage exercise, and was recovering strength. She accordingly went to Cumberland, having had no hemorrhage for a long time. She quickly recruited there, and has never since had a return of her malady. To the effectual application of the perchloride of iron to the proper place, Dr. Cregeen very justly attributes his patient's recovery, as, previously to this, every possible means had been vainly tried, by several medical men, as well as by himself, to stop the bleedings.

I tried the iron myself in a very bad case of epistaxis, where repeated attacks of bleeding were rapidly exhausting the patient. Being an ignorant obstinate man, he positively refused to be plugged, saying he would rather die. I found the iron here exercised very marked control over the hemorrhage, and, the means of applying it being so simple, the patient's wife was able to give him a dose whenever an attack threatened, and so to cut it short.—*Liverpool Medical and Surgical Reports, Oct.*, 1868, *p.* 111.

60.—ON SOME OF THE DIFFICULTIES AND DANGERS OF TRACHEOTOMY, AND THE BEST MEANS OF OBVIATING THEM.

By Arthur E. Durham, Esq., Assistant Surgeon to, and Lecturer on Anatomy at, Guy's Hospital.

The canulas commonly met with in this country are of three kinds, and may be briefly described as follows, it being premised that no canula which is not double is worthy of a moment's consideration. First, The ordinary English canula. This consists of an outer tube, which is complete throughout; and an inner tube, which is so cut away on its convex and concave aspects as to render it capable of being easily passed into and out of the outer tube. The curve of this canula represents about a quarter of a circle. Secondly, The French canula. In this the inner as well as the outer tube is complete. The curvature, as compared with that of the ordinary English canula, represents a smaller segment of a larger circle, or the segment of an ellipse; consequently there is less difficulty about the insertion and withdrawal of the inner tube. Thirdly, The bivalve canula of Dr. Fuller. In this the outer tube is represented by two blades, which may be approximated by the pressure of the finger and thumb so as to facilitate introduction into the trachea, and are afterwards held apart by the insertion of a complete inner tube, through which respiration is maintained.

Without entering into any full discussion of the comparative merits or demerits of the different forms of canula, I would simply state my opinion that the bivalve canula is by far the most objectionable and dangerous. I refer to this especially, because there appears to be a disposition among writers to recommend, and among practical surgeons to use, this form of canula on account of its supposed facility of introduction. Those who have experience of its use, say nothing else in its favour.

Apart from their liability to cause ulceration, the canulas in ordinary use have various faults and defects, which may give rise to much trouble. Sometimes the tube is too long, in which case it presses against the posterior wall of the trachea, and is often ejected. Sometimes it is too short, and cannot be retained unless the plate is deeply buried in the wound.

I have recently devised a form of canula (figured below) which I venture to believe is, in several respects, an improvement upon any hitherto made known. The chief points of originality are in the shape of the canula, and the arrangement by which it is capable of being readily adjusted to the depth at which the trachea may be found to lie. But both of these are, I think points of considerable importance.

Fig. 1 represents the outer tube, which is intended to pass straight back into the trachea, and then to turn downwards in such a way that its extremity

shall lie in the middle of the trachea, and its edges shall not unduly press against the mucous membrane. The straight portion of the tube A slides backwards and forwards in the collar B, but can be fixed at any point by means of the screw C. The portion of the tube in the wound may thus be regulated in length according to the depth at which the trachea is situated. The projection of the end of the tube beyond the collar is by no means disadvantageous. It renders expelled mucus, &c., less likely to be drawn in again by the next inspiration. The collar B is attached to the small plate D, which is connected with the neck plate E by means of two alar processes passing under little wire arches on E in such a manner as to permit a certain amount of motion in various directions. The tube is thus enabled to accommodate itself during various movements and changes in relative position of the trachea and superficial parts of the neck. The plate E is to be secured in its place in the usual manner. Fig. 2 represents the inner tube, the peculiarity of which is, that the distal portion consists of several small pieces jointed together, somewhat in "lobster-tail" fashion. The adoption of this construction is necessary to enable the tube to pass along the straight portion of the outer tube, and then to curve down and fit into the perpendicular portion. This inner tube is so long as to project somewhat beyond the extremity of the outer tube—a very essential point.

Fig. 2.

Fig. 3

Fig. 3 represents the blunt-pointed pilot trocar upon which the outer tube (fig. 1) is mounted, in order that it may be passed into the trachea. The handle is indicated cut off short. I would here remark that the use of a pilot trocar renders the introduction of a cylindrical tube very easy, far more easy than the introduction of a bivalve canula; and the operation is simpler than when a dilator is employed, as recommended by Trousseau. I do not think

that the pilot trocar is generally known. It certainly deserves to be universally adopted. The introduction of a cylindrical tube without the pilot must be a matter of very great difficulty. A sharp-pointed trocar is very dangerous, and should never be used. I cannot but hope that the adoption of some such modifications in the form and construction of the instrument as those I have thus suggested may aid in diminishing those dangers of tracheotomy which arise from ulceration produced by the canula. Canulas and trocars, such as those described, are made of various sizes by Messrs. Mayer and Meltzer.

Third, with regard to *the danger of broncho-pneumonia caused by the inspiration of unwarmed, unmoistened air.* The means by which this danger may be to a certain extent avoided are obvious enough, and should be duly provided in every case of tracheotomy. Such means consist in keeping the atmosphere of the room warm and moist, and in placing over the neck of the patient, when practicable, a small light cradle, on which two or three layers of moistened muslin are lightly placed.

Want of space prevents me from discussing the several classes of cases on which tracheotomy fails to save life, although it cannot be charged with causing death. The most frequent causes of such failure are, first, procrastination of the operation until the last moment; secondly, needless delay during the operation; and thirdly, want of perseverance in the after-treatment.

With regard to the last mentioned cause of failure, I would simply say that I know from my own observation and experience that it is very common. It cannot be too constantly borne in mind that the performance of tracheotomy is like the first charge in a great battle; it may be to all appearance triumphant in its immediate effect, but it is rarely decisive in its result. The battle has to be fought out to the end; and any relaxation of vigilance, any want of energy or perseverance, any sign of giving way, is sure to be taken advantage of by the enemy.

The failure of tracheotomy from needless delay during the operation ought to be much more rare than it is. I cannot but think that such failure is often due to the method of operating ordinarily adopted. I therefore venture to describe and recommend the method which in my experience has proved alike sure, speedy, and safe.

Many surgical writers of eminence advise that in every case a deliberate dissection should be made down to the trachea, the various tissues being cut or torn through layer by layer and carefully hooked aside, and that the operator should pause from time to time to arrest any hemorrhage that may occur, however slight it be. Now such a process is all very well, and perhaps may be advantageously adopted when time is of no consequence, and skilled assistants are at hand. But it very often happens that there is not a minute to be lost, and the surgeon has to rely upon himself alone. In such case a deliberate dissection cannot be made, and unadroit attempts to hook aside the divided structures are more likely to embarrass than to aid the operator. The natural laxity of the tissues of the neck is increased by their division; and the various parts become capable of being moved so easily and to such an extent, that there is great danger of their being pulled more or less out of position. Thus the normal relations of parts may be so disturbed as to mislead the surgeon, or at any rate to hinder the accomplishment of his purpose. It has happened within my knowledge that the cervical vertebræ have been safely reached before the trachea has been found. In this case the trachea on the one side and the large vessels on the other were held scrupulously apart by the assistants who had charge of the retractors. Mr. Marsh alludes to a similar case. The method of operating which I venture to advocate is as follows:

First, Chloroform having been administered, or not, according to circumstances, the patient is put into proper position. A good pillow is placed under the shoulders and upper part of the chest. The head is thrown well back. It must not be supported, nor propped forward by any pillow. The chin is drawn up. The shoulders are drawn downwards—in the adult by traction upon the upper extremities, in the child by means of a towel or shawl placed behind the shoulders—then carried on each side over the acromion and upper

extremity, crossed over the thorax, and securely tied behind and below. The head is placed perfectly straight and firmly held in that position until the operation is completed. The middle points of the upper piece of the sternum, the thyroid cartilage, and the lower jaw give the line. By repeated observation I am convinced that, when the patient is in the position described, these points can be readily recognised even in very young children. A small pad may sometimes be advantageously placed under the nape of the neck in such a way as to maintain or increase as far as practicable the anterior convexity of the cervical spine. I have been thus particular in describing the proper position of the patient, because upon the absolute maintenance of such position the facility with which the operation may be performed very greatly depends.

Secondly, The operator, standing upon the right side of the patient, selects the spot at which he intends to open the trachea, and makes a careful preliminary examination of the parts. Then placing the forefinger of his left hand on one side of the trachea and the thumb on the other, so as to include between them the spot at which the trachea is to be opened, he makes uniform, steady, deep pressure, until he is able distinctly to feel the pulsation of both carotid arteries. The security of the great vessels is thus ensured, and the surgeon has the satisfaction of feeling that the trachea is safely and firmly held between his finger and thumb. Moreover the skin and superficial tissues are rendered tense, and prevented from moving downwards with the knife, as from their great elasticity and mobility they otherwise might do. The finger and thumb thus placed are not to be moved until the trachea is reached.

Thirdly, By a succession of careful incisions strictly in the middle line the surgeon confidently cuts down on to the trachea. The forefinger of the right hand may from time to time be passed into the wound "to make assurance doubly sure" that there is no important vessel in the way. The pressure of the finger and thumb on either side causes the wound to gape, and the trachea to advance. When the trachea is reached, it may either be opened at once by the knife guarded, lancet-like, to within a quarter or a third of an inch from the point by the forefinger of the hand which holds it; or a sharp hook may be used to seize the trachea, and hold it firmly until the opening is made.

Fourthly, When the opening into the trachea is satisfactorily made (and there is no mistaking the moment at which the trachea has been opened), the outer tube, mounted on the blunt-pointed pilot trocar, and already armed with tapes for fixing, is introduced. If the pilot trocar is used, there is rarely any difficulty about this part of the operation; but, as I have already said, the introduction of an open-ended tube must be difficult in the extreme. If the surgeon should not possess a trocar, the tube may be mounted upon an elastic catheter or bougie, as a substitute. But the long firm handle of the trocar renders the manipulation of this instrument much more easy. The withdrawal of the trocar, the tube being held in position, enables the surgeon at once to judge whether the trachea has been properly entered or not.

As a rule, the pressure of the finger and thumb serves to a great extent, if not entirely, to prevent venous hemorrhage during the conduct of the operation. If, however, such hemorrhage should occur to any alarming extent, it is better to introduce the index finger of the left hand into the wound, and apply it firmly to the front of the trachea before the opening is made. The opening, when made, is easily closed at once by the point of the finger, so as to prevent the entrance of blood. And the finger-nail placed on the edge of the opening serves as a guide to the introduction of the trocar.

By the method thus described the trachea is firmly fixed throughout the operation, and the violent convulsive up and down movements which commonly give rise to so much difficulty and embarrassment are effectually prevented. The whole operation from the first use of the knife to the insertion of the canula occupies so brief a period of time that the necessary interference with respiration need give rise to no anxiety.

I wish it to be distinctly understood that I do not suggest this method on

theoretical grounds, but I recommend it because I have tested it and found it good. I have operated in this way in fifteen cases, and in no instance have I had the slightest reason to regret the course pursued. I cannot say the same of other methods which I have tried or seen tried by others.

I have thus endeavoured to show that tracheotomy is not necessarily the fatal operation it is sometimes represented to be; and I have also endeavoured to point out the means by which, so far as I am able to judge, some of the chief difficulties and dangers really attending it may be best encountered and overcome.—*Practitioner, April*, 1869, *p.* 221.

61.—CASE OF TRACHEOTOMY.

By T. R Jessop, Esq., Lecturer on Physiology at the Leeds School of Medicine, Surgeon to the Leeds Public Dispensary.

[The following case occurred during Mr. Jessop's house-surgeoncy at the Leeds General Infirmary.]

Case.—Mary M'G., aged 14, a street-dancer and stilt-walker, from Manchester, was admitted into the Leeds General Infirmary, under the care of the late Mr. Samuel Smith, on the 30th of May, 1862, in consequence of hypertrophy of the thyroid body, attended by some dyspnœa which at times assumed a somewhat violent character, and was then accompanied by noisy inspiration. A careful examination failed to elicit any other cause for the paroxysms of difficult breathing than the enlargement of the thyroid body. The hypertrophy, though marked, was not excessive, was of the usual simple character, unaccompanied by exopthalmos or heart-murmur, involved all three lobes equally, and the middle one lay apparently in its usual position across the front of the upper part of the trachea. The disease had commenced about a year before her admission, and had steadily advanced, the difficulty of breathing keeping pace with the enlargement of the neck.

During the first fortnight of her stay in the hospital an iodine lotion was applied to the neck, and the tincture of iodine given internally, without any apparent result. The size of the thyroid was undiminished, and the difficulty of inspiration remained the same. As the attacks had never been of an alarming character, no extraordinary precautions were taken.

About half-past six on the morning of June 13th, exactly a fortnight after the patient's admission, the night nurse came to my room—in compliance with my requirement, that every nurse should inform me when any of her patients died, whether expectedly or unexpectedly—and, rousing me, said: "Mary M'G. has just died in a fit, Sir." I lost no time in reaching the ward in which the patient was. My bedroom, however, was at one end of the building and the patient was at the opposite end, and on the floor above me. On arriving at the bedside, I found the girl duly "laid out," and surrounded by the large screen, which was made use of for isolating the dead. The face was livid, and no sign of life was manifest. Feeling certain that the patient must have been suffocated, I ran to the operation room, which is situated in the centre of the building, and on the floor above that on which the patient lay, procured the necessary instruments, ran back to the ward, had the body lifted from the bed on the floor, which had been made there owing to the crowded state of the house, and placed on another patient's bed; and I then opened the trachea. The depth of the wound was so great that the ordinary tubes were found to be of no use. I therefore held the wound open by means of a pair of long forceps introduced, while assistants, who had in the mean time been summoned, performed the movements for artificial respiration, as directed by Dr. Marshall Hall. Air entered, and was expelled freely with each set of movements. The body remained quite warm, and every now and then, at very long intervals of many minutes, I thought I could detect a slight fluttering of the heart; but, with these exceptions, no sign of life was manifested until a few minutes before 8 o'clock—nearly an hour and a half after I was called, and, according to the nurse's statement, fully an hour and three quarters after the girl was supposed to have died—when a single distinct and convulsive

inspiration was observed. Shortly, in from forty to sixty seconds, another followed; and subsequently breathing became by slow degrees established, and with it a pulsation at the heart and wrist. The artificial respiration was continued until about 8.30, when it was no longer needed. The patient remained perfectly unconscious all that day and the next, and became able to recognize those around her only at about the end of forty-eight hours.

As soon as the immediate danger was over, a silversmith was directed to make a special tube, of twice the ordinary length; and in the mean time the wound was kept open by an assistant with a pair of long forceps. Her recovery was uninterrupted. At the end of a week, without any further treatment having been adopted, the enlargement of the thyroid had diminished very considerably. In three weeks she sat up, and at the end of two months the thyroid body was only slightly larger than natural; and yet the trachea was so deep that the long special canula alone would reach it.

When the canula was removed to be cleaned, the opening contracted so rapidly that it was found necessary to have a second tube made, in order that it might be introduced immediately on the withdrawal of the first. On August 30th, the introduction of the clean canula having been neglected on the withdrawal of the obstructed one, the wound was found to have contracted so much that it became necessary to enlarge it with a bistoury before the tube could be reintroduced. In consequence of the difficulty experienced each time the tube was cleaned it became necessary that the girl should be kept in the hospital; and accordingly she was hired as a cleaner, the duties of which office she continued to perform until the end of 1865, when, after a sojourn of three years and a half she left the hospital, still wearing the tube. I often tried to induce her to give up the use of the tube, but in vain, as the distress of breathing invariably recurred when in a very few minutes the opening narrowed, and then it became a matter of some difficulty to reintroduce the tube. There was no appearance of disease on laryngoscopic examination, and on closing the orifice of the tube the patient could speak with a bass voice and breathe with tolerable facility.

I have two suggestions to offer for the improvement of tracheotomy tubes as ordinarily constructed. A remark commonly made after performing the operation is, "How much deeper the trachea is than it seems to be!" We may go further with our reflections, and add, "How much deeper the trachea is in the living than in the dead!" In private practice, where the patient resides at a distance from the surgeon, it is no unusual circumstance to be told, on making the morning visit, that the patient, especially if it be a child, has died after a violent fit of coughing during the night. And if the throat be examined, it will not unfrequently be found that the tube has been forced out of the trachea, and is lying irregularly in the wound; that, in fact, the child has died suffocated, because the tube was only just long enough to reach the trachea, and has therefore become readily displaced during the act of coughing, or in swallowing. The ordinary tracheotomy tubes would seem to be made to correspond with the apparent, and not with the actual depth of the trachea—to reach the trachea of the dead and not of the living. Those I am in the habit of using are nearly half as long again as the ordinary tubes, and I find them very advantageous. I had them made after losing two children in the way I have described above.

My second suggestion—the principle of which is, I believe, recognised, but is not sufficiently appreciated by instrument makers,—is, that the two blades of the outer canula should be made so that they lie in *close apposition* at their distal extremities, and are separated only by the introduction between them of the inner canula.

By the adoption of this means the most difficult step in the operation of tracheotomy—viz., the introduction of the canula through the slit in the trachea will be much facilitated.—*Lancet, April* 3 *and* 10, 1869, *pp.* 458, 492.

62.—THE ÆSTHETIC TREATMENT OF HARE-LIP, WITH A DESCRIPTION OF A NEW OPERATION FOR THE MORE SCIENTIFIC REMEDY OF THIS DEFORMITY.

By Dr. Maurice Henry Collis, Surgeon to the Meath Hospital, and County Dublin Infirmary, &c.

The natural condition of the upper lip in its perfect state is as follows:—

Its free margin has the waved outline to which the name of "Cupid's Bow" is given. Its depth is greatest in the centre. Its margin is connected with the inner margin of each nostril by a curved line. These curves, and those of the free margin, correspond, or have a relation to one another; thus, i f the lip be full and freely curved, the lines which pass up to the nostrils will likewise be freely curved, and will include a larger portion of lip than when the margin of the lip is almost straight. In this latter case, the lines referred to are also straight or nearly so. The upper lip may, therefore, be fairly divided into a central, and two lateral portions, joined by curved lines.

The fissures of hare-lip always correspond to this division.

In the double hare-lip, the fissures cut off the central portion along the curved lines referred to. In the single hare-lip, the central portion remains attached to one side and detached from the other, the curved line being still traceable on the larger portion.

These are anatomical facts of some importance, both in a surgical and *æsthetic* point of view. Almost from the time of my student days I have considered the ordinary operation for hare-lip to be deficient in a due regard to the natural condition of parts, and I have followed with interest many efforts made by distinguished surgeons to improve it. Let me first state wherein it is deficient.

The ordinary directions are—first, to divide the frena, true and false, to the fullest extent. Secondly, with knife or scissors to pare the edges, cutting away the rounded corners freely. Some surgeons make these incisions straight, others make them curved with the concavities facing each other.

The evil of dividing the true frenum is that the lip is thrown out of gear, and one of the best means of bringing the distorted nostril into its proper place is sacrificed.

The incisions, whether straight or concave, must result in a straight cicatrix, whereas there can be no doubt that the cicatrix ought, if possible, to follow the curved line which runs, in the natural condition, from the nostril to the margin of the lip. Further, the loss of substance along the margin of the lip is considerable by this method. Hence the resulting lip has a tight margin, which is drawn up by the gradual contraction of the cicatrix, so that ultimately its outline, instead of a graceful wavy line is made up of two straight lines, which at their point of junction allow a tooth to be seen. The contraction of the cicatrix not only tucks up the lip at that point, but it also renders the lip thin along the line of cica trix, whereas it ought to be thicker and more full along that line than elsewhere. In fact, in place of a curved ridge, we got by the ordinary operation a short depressed straight line, with a lip tucked up in or near the centre.

Such are my objections to the common operation.

One of these is remedied by the operation known as Malgaigne's or Sédillot's, which I learned twenty-one years ago from a fine old English surgeon, the late Samuel Smith, of Leeds. He told me then that he had devised it some twenty or thirty years previously. Whether he ever published it I do not know. This improvement consists in reserving the lower portion of the parings at each side, and turning them downwards so as to form a prominence along the margin. This manifest improvement gave me the first idea of my operation. For some years I was content with it, but by degrees I have added one thing and another to it until I have brought it to a point of perfection, that I am not afraid to challenge attention to.

The rules for my operation are:—

1st. Never to interfere with the true frenum. It is not only unnecessary to divide it, but most pernicious.

2nd. Freely to divide all false frena, and if the alar cartilage is misplaced, let the incisions separate it freely so that it may be fairly drawn into its proper place.

3rd. Never to attempt to close the lip so long as the intermaxillary bone is misplaced to any extent.

4th. To preserve and utilize all the parings. They are all wanted, as they all have their proper place; to this point I will revert at length.

5th. To use interrupted sutures, and discard all pins or needles as far as possible.

6th. To leave the line of union exposed, using no dressings or plasters for some days.

And now to justify these rules:—

1. I never divide the true frenum. Its obvious use is to steady the lip, to prevent muscular action from drawing the centre of the lip away from its proper place. Let any one with his finger or tongue try on his own lip what the uses of the frenum are. The division of the frenum unsteadies the lip, makes it tend to run into a string, and, in many cases, leaves a permanent fistula into the nostril. It is, moreover, quite unnecessary, as the parts can be brought into perfect apposition without meddling with it.

2. I freely divide all adhesions or false frena, and I subcutaneously separate all the attachments of the ala nasi to the bone which interfere with the proper formation of the nostril. The advantages of this are so obvious that I need not dilate upon them.

3. Before paring the margins, the intermaxillary bone should be placed exactly in the centre, if not so already. Where there is fissure of the hard palate there is always this displacement. I generally manage this part of the operation by detaching the bone on the sound side by means of a narrow gouge. A strong forceps, with the blades protected with chamois leather, will then force the bone into position. As the nutrient vessels run along the mucous membrane, and chiefly on the inner surface, the gouge is the best instrument for loosening the bone. It may be used freely in this subcutaneous or submucous fashion; in fact, the more freely the bone is loosened the more easy is it to get it into position. The instrument has the advantage of being efficient and simple; no small recommendations now-a-days.

4. I never throw away a particle of the parings. My incisions are made so as to make every fragment of them useful. On one side they are preserved to make the lip thick, and on the other to increase its depth. The method is somewhat complex, but a reference to Fig. 1 will make it intelligible. When dealing with single hare-lip, I take the larger portion, that

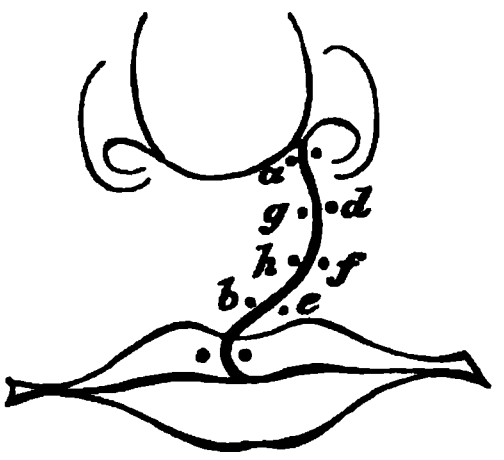
Fig. 1.

which includes the middle bit, and pare it freely from the nostril round the margin from *a* to *b*, until the point of the knife comes opposite the frenum. This incision goes through all the tissues of the lip except the mucous membrane. It follows the curved line of the margin of the fissure, and leaves a long wound, which is curved towards the fissure. The flap is left loose, and attached only by mucous membrane. On the other or smaller side of the lip,

where we generally find the tissues thin, especially as we approach the nostril, the treatment is quite different. I transfix the lip at *d*, close to the nostril, and carrying the knife along parallel to the margin, as far as *f*, I detach a moderately broad flap, which I leave adherent above to the ala nasi, and below to the free margin of the lip well beyond or external to the rounded angle at the fissure.

This flap, which (unlike the one at the opposite side) comprises all the tissues of the lip, is now divided into two at its centre (*c e*). I thus get two loose flaps, a superior (*c d*) attached to the ala nasi, and an inferior (*e f*) hanging on to the free margin of the lip. The loose end of the upper flap is turned up so that its raw surface faces the wound in the opposite side of the fissure, and the loose end of the lower flap is similarly turned down. The point *c* is brought up to *a* and fastened there. The point *e* is brought down to *b* and fastened there. I have thus got on the small side of the lip a wound as extensive as that on the larger side. The upper flap completes the outline of the nostril. The lower one supplements the outline of the free margin of the lip. I thus get a lip nearly double in depth what I could possibly have got by the ordinary incisions (Fig. 2). I shall revert to the treatment of double hare-lip further on.

Fig. 2.



5. I use, as a rule, sutures of horse-hair, as being less cutting than wire and less irritating than silk or thread. Pins, except every fine insect pins, I have discarded. Even these I use but rarely. A well-tied suture holds the parts together with sufficient firmness. It can be removed at any time, whereas the pin must remain until it becomes loosened in its bed by suppuration; hence the mark of a suture is trifling compared with that left by a needle or pin. The spot which requires a pin most frequently is the ala of the nostril. It tends to revert to its old position with more force than the lip, and it often needs the stronger pull of a pin.

I generally insert the upper suture first, then the one close to the line of junction of the red and white, then the two intervening sutures, in the order that seems most suitable in each case. Sometimes I have inserted a suture on the inner or mucous surface of the lip. Sometimes this is not necessary. Generally I put a fine suture just along the free margin to keep the lower flap in its new bed until it contracts adhesions there.

The sutures are removed, one after another, those near the margin first, the upper two last. As to time of removal much will depend on the age of the child, and on the firmness of its flesh. Thus in a strong child a suture may be left three or four days, while in one more delicate it may have to be removed in forty-eight hours. Sutures should never be left long enough to ulcerate.

6. By this treatment of the sutures, plasters and dressings are dispensed with until some days have elapsed. They are applied only when the sutures are removed, and with a view to prevent the lip from thinning. I generally find that all the wound heals by first intention, and the presence of plasters rather interferes with this process, at least so long as the sutures are left. When plasters are used they have to be removed when we wish to inspect the lip, and their removal disturbs the delicate process of union. By leav-

ing the wound uncovered we can watch the progress of the cure, and it is easy to apply a strap at any moment if it be really needed. The use of Hainsby's truss will, in most cases, make it quite unnecessary to use plasters of any kind. Collodion is sometimes useful, but it should be made very thick. The ether in thin collodion acts injuriously on the healing process.

As to the age for operating, I have done so successfully in a child under three weeks, and I have seen others of twice as many months on whom I refused to operate. The question is entirely one of the strength of the child, and the firmness of its flesh.

With regard to complicated double hare-lip, the first point to be attended to is, in like manner, the strength of the child, which, as a rule, is far below par. When, by careful feeding, this has been brought up to a proper state, the protruding intermaxillary bone has first to be replaced. It should never under under any circumstances be removed. This is, in fact, so well established an axiom of surgery, that it need not be insisted on. It is not always easy to bring it into its proper site. There are three methods to choose from; one is to separate it completely from all bony attachments, and to leave it for a time pendulous, adherent only to the central portion of the lip. This is the best way when practicable. The second is to take a V-shaped piece out of the vomer. The third is a new method which I have tried, and which has the advantage of helping materially to lessen the gap in the palate. It consists in cutting off an oblique portion of the vomer along with the intermaxillary bone. Whichever method is adopted, the bone is best left undisturbed for a few days after this stage of the operation. Nothing is more fatal to success in these cases than the effort to do too much at a time. A few drops of ether will sufficiently anesthetize the child to prevent its being frightened by repeated operations; success of the highest kind can only be obtained by doing the operation bit by bit. It is easy no doubt to conclude all at one sitting—but not to conclude all well. I therefore advise that, as a rule, the bone when detached in any of the above methods, should be left undisturbed for a few days before any attempt is made to push it back or retain it in its new position. Yet if it goes back easily, the remainder of the operation may be done at one sitting.

I treat the middle bit of skin as in simple hare-lip, paring its margin in a curved manner, and leaving the parings attached by the mucous membrane; the outer portions are treated exactly as in single hare-lip, and the sutures are practically the same. In double hare-lip they are best inserted, and tied from below upwards. The amount of the central portion which can be made to contribute to the lip, is never very great, and the strain on the upper portion of lip is often very considerable. In these cases the use of Mr. Hainsby's truss is of the greatest service.

It is surprising how beautifully the flaps, made after my method, fall into and fill up the places intended for them; how naturally the form of the nostrils is restored, and the curves of the lip. The faithful woodcuts of Mr. Oldham show the perfection of outline, and the great increase in depth of the lip as contrasted with the results of the old operation.

In conclusion, I recommend this improvement in plastic surgery to the kind consideration of my professional brethren. I am satisfied that when tried it will be found a real advance in operative surgery, and one that all will confess was much needed in this department.—*Dublin Quarterly Journal, May*, 1868, *p.* 292.

63.—ON HARE-LIP.

By Haynes Walton, Esq., Surgeon to St. Mary's Hospital.

[The cases referred to in the following paper were all of the single complicated variety, in which were involved the lip, and the upper jaw on one side.]

The first question to be discussed is the period at which an operation should be undertaken for the closure of the lip. My own experience tells me that it should be done as soon as possible after birth—that is, within the month—in

all cases which, like those under consideration, the bone is divided as well as the lip. Except the lip be closed the child cannot nurse, and even fails to take sufficient food in any other way because it cannot swallow quickly all that is put into the mouth; and emaciation ensues, and renders it less fitted for the operation, and is often the cause of death. Many surgeons are deterred from operating so early from the fear of fatal convulsions; but it is my belief that the liability to such has been greatly over-rated—that their appearance is due to loss of blood, and not to the mere irritation of the operation, and that more lives will be saved by operating a week or two after birth than by doing so some weeks or months later, when the child has all the marked symptoms of starvation, and is therefore unfitted to lose a drop of blood. I have myself operated many times before the child was a month old, and in every instance with perfect success. It has been erroneously supposed that in very young children the flesh is so soft that the pins or sutures readily cut through it. I say, therefore, as soon as the unfortunate child is born, have it fed most carefully and sufficiently long each time, till enough, or nearly enough, milk is consumed, and operate early, and before emaciation sets in. When the lip is united it can suck, or be fed. In those cases in which the lip only is cleft, the operation may be delayed without disadvantage, because the taking of food is not interfered with. In the miserable child lately before us, about two months old, there was so much emaciation that I kept it in the hospital for a fortnight, and had it fed by a clever nurse, and so improved its condition a little. It seemed scarcely safe to operate on such an ill-nourished subject.

Whether it be better for the health of the child or not to give chloroform is not easy to decide. Sometimes I give it, and sometimes I operate without it; but of this I am certain, that at this early age the surgeon derives no benefit from its administration. The patient is too feeble to offer any resistance.

The lip is the portion of the deformity first to be operated on, and there are three steps or stages to be accomplished. Failure in any of them will be fatal to success. The first to be done is the paring of the edges, whereby it is prepared for adhesion. This procedure is very often improperly executed. The child should be secured for the operation, and the operator should stand in a convenient position. These can be accomplished only by the operator sitting, and holding the head of the infant between his knees, while the rest of the body is supported by an assistant. I operate, as you observed, with a very narrow scalpel. I transfix above, and cut downwards in a curved direction, because when the two curved surfaces are brought together, the free edge of the lip is thrown sufficiently down. When the incisions are made straight in a A-shape, the edge of the lip is not natural, but there is a retiring angle, that which generally constitutes so much after-deformity.

The manner of dealing with the hemorrhage is simple. If the coronary arteries be compressed with the fingers, on one cheek by the operator and on the other by the assistant, no blood will be lost, if the operation be quickly done, that can hurt the child. The operation can be proceeded with while such pressure is being made. As soon as the lip is put together, the arteries cease to bleed. Every part of the edge of the fissure must be removed, together with some of the red portion, no matter how extensive may be the incision necessary to accomplish this. Few young surgeons have courage enough to take away a sufficiency. Attention should next be directed to the alveolar process. If there be the slightest projection, the prominence should be brought to the level of the rest, by snipping through the arch, at the spot between the lateral incisor tooth and the canine, with the forceps, and pushing it back. On no account should any part be cut away. The teeth are to be preserved, and the mouth made more perfect by following my plan. In my last case I was able to fill up the gap in the bone, as you saw. The loosening of the lip—that is, the raising of it from the surrounding parts—should now follow, and I do not know how I can impress on you the importance of doing it to the required extent, except by asking you to remember how extensive was my dissection, and telling you that without it there will be frequent failure of union. It must be so separated all round, even in the

direction of the nose, that it will hang loosely, and admit of being transposed so completely that there shall not be the slightest tension when the parts are brought together. You will not forget that the child's nose was fairly separated from the maxillary bones.

The last proceeding is the adjusting of the wound. This little practical fact which I giveyou will save you much trouble, and benefit your patient. Commence the adaptation from the lowest part. Begin by making the edges below correspond, and all the rest will easily fall into a proper place, no matter what the dissimilarity in the length of the two flaps. You saw how carefully I did this with a soft iron pin. To complete the operation on the outside of the lip, I used two other pins, in all three of them. In securing the pins with the ligatures, I tie each separately, and it does not matter whether this is done with a single round tie, or by twisting the thread in the figure of 8. I generally end the whole by an internal suture near the edge of the lip, to ensure the healing of the mucous membrane. The best result will be got if you follow my steps, even better than the plans of Malgaigne and Langenbeck. The sutures are generally removed too early. Take out one pin at the end of four days, then another each day, and then the stitch. A truss for pushing the cheeks forward is useful in most cases. The parts are kept quiet, and any strain on them is prevented.—*Lancet, Nov.* 21, 1868, *p.* 662.

ALIMENTARY CANAL.

64.—THE CURE OF CLEFT PALATE.

By Thomas Smith, Esq., Assistant Surgeon St. Bartholomew's Hospital, and Surgeon to the Children's Hospital.

[Hitherto the operation of staphyloraphy has never been successfully performed except at or after fifteen or sixteen years of age, because the consent and help of the patient himself is necessary. The plan of systematically dividing those muscles that tend to draw asunder the margins of the cleft, as suggested by Sir William Fergusson has nearly brought the operation to perfection, still the inability to cure the defect at an early age has never yet been got over.]

The advantages of being able to cure cleft palate in childhood will at once be conceded by those who are familiar with the deformity, and the inconveniences it entails. The imperfections of deglutition, taste and smell, and the unnatural thirst, will probably be remedied at whatever period of life the cure of the deformity be effected. But it often happens that the union of the palate by operation is accomplished too late to do more than slightly improve the defective articulation, though it may cure the nasal resonance of the voice.

A resolute and intelligent adult patient, after a successful operation, may acquire by his own efforts, or with the aid of an instructor, the power of distinct and normal articulation. But in some the difficulty of unlearning an almost life-long habit is well nigh insuperable.

It is probable that were the deformity of cleft palate cured in childhood, before or whilst the power of speech is being acquired, there would be but little difficulty in teaching a child to articulate distinctly.

It is at least certain that the earlier the cure was effected, the less difficulty would the patient have in learning to speak plainly.

The plan which I venture to introduce depends largely for its success on the employment of an instrument whereby the jaws are opened and fixed, the orifice of the mouth is dilated, and the tongue is held down; and this without in any way incommoding the operator, or encroaching on the small space at his command.

By the use of this instrument the patient is rendered perfectly helpless; the palate and fauces are brought plainly into view, and much more room is obtained for the manipulation of instruments that can be gained by the most

strenuous voluntary efforts of the patient. Chloroform can and should be used, and thus the operation may be performed with far greater rapidity and precision than when the surgeon is dependent upon the self-control of even the most courageous patient. The instrument in question, which is a species of gag, consists of a tongue-plate for depressing that organ: attached to this plate are two lateral expanding arms of a peculiar shape, which can be opened by a key working on a cog-wheel: these are for dilating the orifice of the mouth; they have teeth plates which act upon the jaws and open them. A strap is made to pass round the back of the neck, to keep the instrument in position.

This gag will be found useful in excision of the tonsils of unruly children, in operations on the pharynx and interior of the mouth. It can be used in operations on the tongue, but if employed for this purpose, it must be turned upside down. *i. e.* the tongue-piece must rest against the roof of the mouth.

I should think it might prove of service in laryngoscopy, and especially in operations on the interior of the larynx when it is important to economise space and secure a steady position.

I may be excused for shortly stating the details and order of operative proceeding that I have found most useful when performing staphyloraphy under chloroform.

It is important that the stomach should be quite empty, and equally so that the patient should be in no degree in want of food, so as to avoid both chloroform sickness on the one hand, and the necessity of taking food soon after the operation on the other.

The patient being under chloroform, in the recumbent position, in front of a window, his head may be supported on a pillow by an assistant standing behind the table. The gag being introduced, closed and the strap drawn tight, the jaws and lips can be opened to the desired extent and the instrument may be given into the hands of the assistant who holds the head.

The following is the order of proceeding that seems best adapted to the circumstances of the operation when done under chloroform.

1st. To pare the edges from below upwards.

2nd. To pass the sutures.

3rd. To draw up the palate holding all the sutures in one hand, and with the palate on the stretch to divide, if necessary, the palato-pharyngeus, and subsequently the levator palati; if the palate will not come easily together, two lateral oblique cuts may be made, one on either side above the highest suture, separating the soft from the margin of the hard palate to a small extent.

4th. To sponge out the parts, and tie the sutures beginning at the lowest.

5th. To avoid using the sponge, if possible, until the close of the operation.

Sickness occurring during the operation is an embarrassing circumstance, though by no means an insuperable difficulty. On two occasions I have postponed the operation on observing the child vomit while taking chloroform. On four occasions I have satisfactorily completed the operation notwithstanding the sickness.

The paring the edges of the fissure from below is important to avoid being embarrassed by the flow of blood from above. It is well to postpone the division of the muscles until late in the operation for the same reason. By drawing the palate forwards by means of the sutures the muscles which prevent the approximation of the fissure are at once appreciated, and by thus putting them on the stretch their division is facilitated.

The use of the sponge to the palate, as is well known, increases the amount of tonsillar secretion, and is apt to excite vomiting. If the steps of the operation be done in the order above described, its use is seldom required until the last stage.

The material that I have found best adapted for sutures for the soft palate in the young, is *fine fishing gut*, if there be any tension on the suture; while *horsehair* has answered best for the lower part of the velum and uvula, or in any case where the sides of the cleft come easily together. Both these substances, if soaked for a few minutes in water, will become sufficiently supple

for use. They have the advantage of being quite as unirritating to the tissues as silver wire; while being softer t hey cause less pain during the movements of deglutition; they do not abrade the tongue, and, unlike wire, they can be re moved without giving pain to the patient, or disturbing in any way the newly united soft parts.

In fastening both gut and horsehair sutures, a third knot should be added to the ordinary double knot usually tied; this is a necessary precaution to be secure against slipping.

I have tried, with good result, the clamping down the suture with a perforated shot in lieu of tying: this is apt to cut the suture, unless a small glass bead be threaded on the sutures and passed down in front of the shot.

In regard to the unirritating nature of both gut and horsehair when introduced into the tissues, it may be worth mentioning, that in a little girl, aged nine, I removed the sutures more than a month after they were introduced; and at that time the wound was perfectly and soundly cicatrised, the sutures appearing to cause no sort of inconvenience or irritation.

With a view to simplify and expedite the performance of the operation I have found it convenient to dispense with the silk threads generally used for drawing the permanent sutures into position, and, instead, to pass the gut or horsehair at once through both sides of the cleft palate.

This can be done by employing a fine and rather sharply curved tubular needle, or by using a needle in a handle bent at nearly a right angle, with an eye near the point. One can imagine that the width of the cleft might be so considerable as to prevent the passing of the sutures in the manner described, but when practicable, much time and trouble may be saved by the adoption of the plan.

In order to adapt the needles to the small dimensions and delicate structure of the soft palate in children, I have had them flattened laterally, instead of on the concave and convex aspect, as is usual in curved needles. This allows of the needle being made much finer without any loss of strength at the curve.

It is advisable in operating on children that forceps should be sparingly used to the margins of the palate. They were, therefore, only employed in passing the first or lowest suture. When this had been adjusted, it was used to draw the palate forwards, so as to bring the free edges somewhat together and within easy reach of the needle for passing the next suture. Thus, in turn, each suture was used to assist in adjusting the one next above it; this plan saves much trouble and avoids bruising the margins of the cleft.

In every case the principles recommended by Sir W. Fergusson have been carried out, though the plan used for dividing the muscles has been that practised by Mr. Pollock. That is, the levator palati has either been divided (or at all events its division has been attempted) through a puncture in front of the soft palate, the palato-pharyngeus has usually been notched and occasionally the palato-glossus. Where the soft parts were very scanty, and the tension considerable, oblique lateral cuts have been made at the upper angle of the fissure, separating the soft palate from its attachment to the bones for a small extent.

The patients operated upon have been allowed a liberal supply of wine and fluid nourishment after the operation, and have not been confined to their beds.—*Medico-Chirurgical Transactions, Vol.* 51, 1868, *p.* 82.

65.—ON THE LOCAL TREATMENT OF DISEASES OF THE THROAT.

By W. M. Banks, Esq., Liverpool.

The affections of the throat most commonly met with are, speaking very roughly and generally, as follows:—(1) Ulceration of the larynx either of a syphilitic or of a tubercular origin; (2) chronic follicular disease of the pharyngeal mucous membrane associated with more or less hoarseness and pain in speaking, known as *dysphonia clericorum;* (3) aphonia, or loss of voice, which when merely temporary is only the result of congestion of the mucous

membrane of the vocal cords after a bad cold or sore throat, but when permanent generally proceeds from defective action of the laryngeal muscle. This defective action is due, either to some distinct paralysis of the inferior laryngeal nerve, or to extreme general debility. Of course, there are many other affections, which come under the notice of the specialist, but these are the most commonly met with in the general run of practice.

[There have been many plans suggested in order to bring our remedies in contact with the affected air-passages. Inhalation of the steam of warm water impregnated with the medicinal agent was the first idea. Afterwards the use of spray by means of injections was tried, and with success, especially the plan invented by Dr. Bergson, of Berlin, of two glass tubes with capillary points placed at right angles to each other.]

Last year, Dr. Adams, of Glasgow, most ingeniously contrived to simplify an apparatus, just as Mr. Heath has done with Thudichum's machine, and has reduced its price to a matter of five shillings, rendering it at the same time much smaller and more easy to work.

The instrument, which is made of block tin, and is only about five inches in height, resembles very much a common lamp. It consists of a tubular boiler with an opening into which the water is poured, and which is fitted with a cork which acts quite efficiently as a safety valve, since, should the pressure of the steam prove excessive, it will certainly be blown out before the boiler will burst. From the position of the opening only the proper quantity of water can be poured into the boiler. The lamp being lit, steam is generated in the upper part of the boiler, and rushing through the upper tube which leads from the boiler, it sucks up the medicated fluid from the bottle along the lower tube, and carries it along with it in the shape of a warm soothing mist. The advantage of the tubular boiler is, that the steam is generated quicker, and a fuller supply kept up, while it is at the same time super-heated and dried. In simplicity and ease of management this instrument, if steam is desiderated, cannot be surpassed, and it may be safely intrusted to the care of the most inexperienced nurse or servant without fear of danger. Dr. Adams's instrument is capable of being used in all diseases of the throat and larynx, but my own impression is that the steam does best when the bronchi are to be reached. Cases of gangrene of the lung and fœtid bronchorrhœa can be deprived of much of their loathsome nature by this means; and in many cases of chronic bronchitis and phthisis, when the hacking night cough deprives the patient of his sleep, a most soothing effect can be obtained by a good inhalation, before bedtime, of some balsamic or narcotic tincture.

Within the last eighteen months, since the rise of the great sulphurous acid mania, not only the profession, but the general public, have become familiar with the instrument which goes by the name of "*The* Spray-producer," and which consists of a modification, by Winterich, of Bergson's tubes, having attached to them Dr. Andrew Clark's hand-ball, by which air is employed as the atomising medium. Messrs. Mayer and Meltzer, of Great Portland-street, London, keep the tubes with points constructed to direct the jet of spray either directly backwards against the pharynx, or upwards behind the soft palate, or downwards to the larynx. They also have a smaller tube, intended for the nostrils, the delicate point of which being protected by a small vulcanite ball prevents the patient doing it or himself any harm. Last February, in the Medical Times, a new form was made known to the public by Dr. Brakenridge, which is intended to be portable, and capable of being carried in the pocket without fear of breakage. The bottle is dispensed with, and the lower tube fulfils the office of a reservoir. The instrument, enclosed in a neatly fitting leather case, is about four inches in length.

The value of the spray-producer is so self-apparent as to account at once for its popularity, and one of its principal merits is, that it can be worked by anybody after a single trial. Very few people, as a rule, can swab out the larynx satisfactorily, and patients, after a little while, are apt to get tired of the trouble of fixing up the larger instruments in which steam is the atomising

agent; but this is small, portable, easily managed, and ready at a moment's notice. Of its applicability to cases of diseases of the nasal mucous membrane I have already spoken, and its value in chronic throat affections I have thoroughly satisfied myself of; but I am also sure that we have in it a most efficacious weapon in combating such serious acute affections as putrid sore throat, scarlatinal cynanche, and diphtheria itself. Hitherto one of the greatest desiderata has been to obtain some means of getting at the disease after the swelling of the parts has rendered useless our attempts by the ordinary methods of gargling, or swabbing, or touching with solid caustics, while the patient has become too exhausted to undergo the fatigue of inhalation. In such a case, if we can only introduce the nozzle into the patient's mouth and get him to draw down the disinfecting spray as it is poured forth from the instrument, we may not be too late to check the advance of disease. In the August number of the new journal, "The Practitioner," Dr. Beigel, whose labours have tended greatly to popularize the use of atomised fluids by inhalation, has drawn attention to this very point, and strongly advises the use of spray in croup and diphtheria. As to the remedies to be employed, I need say little or nothing, they depend so much on the special case to be treated. As astringents, alum, nitrate of silver, and the glycerine of tannic acid, are in universal use; and as antiseptics, iodine, carbolic acid, and though last, not least, the much-talked-of sulphurous acid, are probably the best. There has been a good deal of writing lately upon the value of iodine inhalation in diphtheria, and I think that the compound of iodine and carbolic acid, which I referred to a short time ago, will be found a very excellent remedy. Dr. Beigel, in the paper just referred to, gives the preference to lime water (about 1 to 30 of water), (to which is ascribed the power of dissolving the pseudo-membranes of croup and diphtheria), and repeats the inhalations every two hours.—*Liverpool Medical and Surgical Reports, Oct.* 1868, *p.* 116.

66.—ON THE USE OF COFFEE IN STRANGULATED HERNIA.

We believe that all our English writers on Surgery totally ignore the value of this remedy, trusting to what is no doubt a far more potent therapeutic agent—namely, chloroform. But there are cases where, for certain reasons, chloroform should if possible be avoided; and these are just the cases in which the other old remedies, such as the hot bath and tobacco enemata, are likewise dangerous. If a remedy could be found which would act in reducing a hernial obstruction without exciting dangerous symptoms of depression, it would obviously be a great boon to surgeons. Dr. Marchand, in an elaborate article on the therapeutic action of coffee, has collected a sufficient number of cases of strangulated hernia in which this simple remedy has proved successful, to warrant us in recommending its further trial. It appears that in the Havana coffee has from time immemorial been employed for the reduction of hernias. A French surgeon, Durand (de Batignolles), when residing there, saw it several times applied with success, and on his return home in 1857, he tried the remedy in France. A hernia of thirteen years' standing became strangulated, and all ordinary means, as the taxis, ice, draughts containing belladonna, &c., proved ineffectual, an operation was decided on, when M. Durand declared that he knew a sovereign remedy, which he begged to be allowed to try. His offer being accepted, he ordered 250 grammes (about half a pound) of powdered roasted coffee to be added to twelve cupfuls of boiling water, and of this a cup was to be taken every quarter of an hour till eight cups were taken, after which half an hour was to elapse between each dose. After the fifth cup the patient felt gurgling in the tumour, and the ninth cup was followed by the spontaneous reduction of the tumour. This case was published by Triger in the Gaz. des Hôpit. for May, 1857, and, as might be expected, not only excited *un vif étonnement*, but led to further trials. In the following year (1858) Meyer reported the case of a man, aged 62, in whom there was a spontaneous reduction of hernia after the sixth

cup; Czernicki reported a similar case which yielded to the fourth cup; and Barasent described the case of a woman to whom, after twenty-four hours vomiting, he gave coffee, and whose hernia yielded to the fourth cup.

In 1859, Rouzier-Jolly, of Clermont-l'Hérault, published two cases in which he combined the coffee treatment with the local application of belladonna ointment. Although there was intestinal hemorrhage, in both these cases, from, as he thinks, the use of too large doses, he adds that we should not, on account of such accidents, renounce a remedy which is "as active as it is successful." In the same year we are told that "Sammert en Angleterre" reported another successful case. We suspect that some evil has befallen our compatriot's name in the hands of the French author.

In 1860, Paultrier, and in 1861, Lamare-Piquot (of Honfleur), and Cellarius, adduced additional evidence of the value of this remedy; but the two last-named writers differ as to the mode of action. The former holds that it acts by occasioning *decongestion* of the strangulated part of the intestine, while the latter thinks that it acts by exciting the contraction of the intestinal fibres, which thus gradually liberates the strangulated portion.

[We refer our readers to an article by Dr. Sammert, of Malta, on this subject. Retrospect, Vol. xxxvii, p. 199.]—*Medical Times and Gazette, Jan.* 2, 1869, *p.* 18.

67.—ON OPENING THE SAC IN CASES OF STRANGULATED HERNIA.

From a Report on the Practice at St. George's Hospital.

The practice of opening the sac in operating for strangulated hernia is much more frequently adopted at some hospitals than at others. At St. George's Hospital it is generally done, and the operation without opening the sac forms the exception to the rule. One reason given for this practice is, that the condition of the bowel can in that way be ascertained; but a more important reason, and one lately much insisted upon by Mr. Henry Lee, is, that the fluid contents of the sac (if this be not opened) are returned together with the intestine into the abdomen. These contents consist often of lymph, blood, and serum, in which various alterations are taking place. Now it is well known that decomposing fluids are absorbed with great rapidity from a serous surface, especially if that surface be large. If any bloody fluid or lymph be contained in a hernial sac, and that sac be not opened, then when the bowel is returned the fluid is returned with it into the peritoneal cavity. This fluid, mixed perhaps with decomposing blood, is looked upon by some as a fertile source of peritonitis, and great care is taken to remove it after the sac is opened in the operation for strangulated hernia. In two cases which occurred in St. George's Hospital two weeks ago these facts were particularly dwelt upon. In one of these, a patient seventy-five years of age, when the sac was opened a net-work of white lymph was seen forming a loose kind of inner sac; and in the other case, in which the taxis had been firmly applied, the sac contained a quantity of bloody fluid. The fluid contents of the sac were carefully removed in both these instances before the hernia was reduced, and the patients are both doing well.—*Lancet, Jan.* 23, 1869, *p.* 120.

68.—ON THE USE OF THE ETHER-SPRAY IN OPERATIONS ABOUT THE ANUS, AND ESPECIALLY IN THE TREATMENT OF HEMORRHOIDS.

[By Holmes Coote, Esq., Surgeon to St. Bartholomew's Hospital, and Lecturer on Surgery.

External piles are commonly nothing more than some of the veins at the lower part of the rectum considerably enlarged, and covered partly by mucous membrane and partly by the thin integument near the anus. In order to

effect their removal, there is no need for so painful an operation as that of strangulation by the ligature, nor need they be burnt with strong acids, nor the heated iron. Let the surgeon satisfy himself by digital examination that there are no internal venous enlargements, and he may then at once remove these swellings by the scissors.

But in order to effect this without pain the ether-spray must be used, when in a few seconds the hemorrhoid becomes white, tough, and completely congealed. I was lately requested to examine a gentleman suffering from piles. He was in great pain, and on examination I found the margin of the anus surrounded by such swellings in a state of great tension and heat. So anxious did he seem for relief, that I punctured the most tense and prominent of the swellings at once, and let out a small amount of blood, partly fluid and partly coagulated. The remainder of the hemorrhoids were rapidly congealed, and removed in this case by the knife, the patient being scarcely conscious that anything was being done to him.

In other cases where it had seemed to me that the venous enlargement involved not only the external but also some of the internal veins, a modification of this proceeding was necessary. The hemorrhoidal mass having been moderately but not violently forced from the anal outlet, the whole mass is to be frozen by the ether-spray. The surgeon should be prepared to seize it, if necessary, with a pair of double-hooked forceps to prevent its sudden and spasmodic return. The congelation having been effected, long hare-lip needles are run through the base so as to transfix it; around each of these needles (for usually two, or perhaps three may be needed) a ligature is turned in the figure of 8, sufficiently tight to control hemorrhage but *not to produce strangulation* of the tissues, a condition always excessively painful. The frozen piles are then removed by the scalpel or scissors, the patient scarcely feeling the incisions.

In the course of twenty-four hours the needles and ligatures can, if necessary, be removed, but the bowels must of course be kept quiet, so that their presence gives but little inconvenience, especially if the points of the needles are removed by proper cutting pliers. The wound which is left may be a little irritable for a few days, but this condition may be remedied by the use of an opiate lotion.

Hemorrhoids strictly internal are best treated by acids or the cautery; and in using the latter, we must remember that the freezing apparatus with the ether-spray is barely applicable, the crystals of ether formed in the frozen part being inflammable. In the application of the acid we must be guided by the following rule, namely, so to use it as to produce slow inflammatory shrinking and consolidation of the enlarged veins, but not so deep a destruction of tissue as to cause a slough which will open into the veins, at least with any rapidity; for under such circumstances we may find the patient's rectum suddenly full of blood, and the amount may even be such as to cause anxiety for the patient's life. Of this event, namely, hemorrhage into the rectum, an example is related by Petit. A patient had hemorrhoids which were supposed to be external, while in truth they were only temporarily protruded. Almost immediately after they had been cut off, the skin which had supported them was drawn inwards. Internal hemorrhage ensued which could not be suppressed, and proved fatal in less than five hours. The rectum and colon were found full of black coagulated blood.

It is true that in the present day we possess instruments to plug the rectum, to distend it, or to admit of the introduction of ice; but all these proceedings are painful, nor are we always sure of controlling internal hemorrhage beyond the limits of the plug.

We must, however, confess that there are many cases in which the shape of the tumour is such as to be best treated by the ligature, tied so tight as to completely strangulate the parts. In these cases the ether-spray may be used with advantage, both at the time of the operation and afterwards, in allaying pain. The ligature should be of strong dentist's silk, well waxed, so as not to be acted on by moisture; it should be so strong as to defy breaking by one pair of hands, and the knot should be so tight as quite to destroy the

enclosed tissues. For if not, and any degree of vitality remain, painful swelling shortly supervenes and the patient's sufferings return. Also the surgeon should recollect that the "external integument" is highly sensitive, and that the act of including any portion of it in ligature must of necessity be painful. He should therefore sever the skin from the hemorrhoid by the use of scissors, and be careful that it is mucous membrane and vein only which is included in the noose.

Finally, the ether-spray may be used as a means of relief to those suffering from inflamed piles, and unwilling to submit to operation. I lately saw a lady in this condition. She had suffered so much from a mass of hemorrhoids, which were subject to occasional discharges of blood, and occasional attacks of inflammatory swelling, that her courage was quite gone. I found her in great agony; the anal outlet occupied by a mass of tense hemorrhoids of livid red colour, looking, to a casual observer, as if they were on the point of sloughing. The ether-spray caused them to become white, shrunken, and insensible to pain, and even when this state of congelation had passed away, the lull of pain lasted a considerable time, and the opportunity was thus afforded for other measures by means of which her restoration to health was ultimately effected.

The ether-spray may be used in many other operations about this region. —*Practitioner*, *April*, 1869, *p.* 203.

ORGANS OF URINE AND GENERATION.

69.—PRACTICAL REMARKS ON THE TREATMENT OF URETHRAL STRICTURE, WITH A DESCRIPTION OF A MODIFICATION OF HOLT'S INSTRUMENT.

By Dr. Freeman J. Bumstead, New York.

[During a period of eight months, Dr. Bumstead treated thirty-three cases of urethral stricture; of these, eight were treated by simple dilatation, with bougies and sounds in the usual manner.]

The advantage of conical bougies with olive-shaped points, although long known, is not so universally appreciated as it should be, as evinced by the fact that these instruments have several times within the last year or two been brought forward as new. The bluntness of their points, which prevents their engaging in the lacunæ of the canal, and the flexibility of the constricted neck, which facilitates their adaptation to the urethral curves, render their introduction both easy and safe even in the most inexperienced hands; and, again, the conical shape of the shaft materially promotes the process of dilatation. This form of bougie cannot be too highly recommended, especially to those who have only a limited experience in the use of urethral instruments.

Catheters made upon the same principle, with conical extremities and bulbous points, are admirably adapted to cases of retention of urine dependent upon the enlarged prostate of old age or prostatitis, or upon ordinary organic or spasmodic stricture, if passable by anything larger than a filiform bougie.

The French "*bougies à boule*" afford the only means available (aside from the endoscope) of detecting slight urethral contractions upon which the persistence of chronic gonorrhœa or a gleet often depends. They are also of great value in determining the length of strictures, as well as the presence of a second contraction beyond the one first met with. The term "*à boule*" is inappropriate, since the point should not be spherical or olive-shaped, but rather be furnished with an abrupt shoulder, which affords the greatest delicacy to the touch in passing slight contractions. I have been in the habit of calling them "acorn-pointed bougies." Different sizes are, of course, requisite.

"Filiform bougies," the point of which is even smaller than one-third of a millimetre in diameter (No. 1 of the French scale), are indispensable in the

treatment of tight strictures. The absurdity of the American scale is shown by the fact that its smallest number measures two and one-third millimetres, or seven times the diameter of the bougies referred to. Hence, the surgeon provided only with instruments corresponding to the American scale will find many "impassable" strictures which can readily be passed with smaller instruments, and in cases of retention of urine, will be tempted to resort to uncalled for violence, or to puncture of the bladder. In the great majority of cases referred to me as "impassable" strictures. by physicans in general practice, the first trial of a filiform bougie is found to surmount the obstacle.

The best French bougies are those made by Lasserre, No. 5 Av. Victoria, Paris. Those sold by Weiss, in London, are superior in that they are not so adhesive, but they are much more costly.

From Nos. 14 to 30 inclusive, instruments either of steel, block tin, or fusible metal may be employed, and possess the advantage of their surface not yielding and becoming indented in the presence of a firm stricture. The curve, or rather double curve, known as Béniqué's, the anterior curvature corresponding to the natural curve of the urethra at the peno-scrotal angle when the penis is in a flaccid condition, is a very desirable one, especially with deeply-seated strictures. The extremity of the instrument should taper off for an inch and a half to two inches, so that its point may be two sizes smaller than the main body of the shaft. Thus the point will readily enter a stricture through which the next smaller size has already been passed, and we obtain the advantage of the principle of the wedge in promoting and hastening dilatation. The same plan enables us to dispense with the sounds of every other number in the construction of portable cases of small bulk.

Twenty-five of the thirty-three cases of stricture referred to at the commencement of this article were treated by rupture or by urethrotomy, either internal or external. This may seem a larger proportion, but it is not an unjustifiable one, in my own opinion. During the first eleven years of my practice I employed simple dilatation almost exclusively, except in the small proportion of cases in which, from the presence of perineal fistulæ, or other causes, perineal section was absolutely requisite. Subsequently I was led to make a thorough trial of Holt's method, and of the urethrotomes of Maisonneuve and others; and now, after five years' further experience, I feel fully convinced that the immediate treatment of stricture either by incision or rupture, is not only as safe as that by dilatation, but that it saves much valuable time, and that its results are more permanent and satisfactory. Instead of weeks, or even months, devoted to the repeated introduction of instruments, which cannot be said to be free from danger, the stricture is removed at one sitting with an amount of risk which I believe is even less than the aggregate of that incurred in dilatation; and the tendency to relapse is by no means so marked. Entertaining this opinion, I cannot but regard the opposition to operative procedures in cases of stricture as unfounded; and especially do I deem it unfortunate that the statement, which is said to have emanated from eminent surgeons, should have found its way into print, to the effect that strictures can as well, or better, be treated by rest in bed and low diet alone, as by any other method.

Holt's Instrument.—Holt's instrument for the rupture of stricture is now well known to the profession, and has acquired wide and deserved celebrity. My first trial of it was about five years ago, and I have now used it in upwards of thirty cases, in most of which it has proved highly satisfactory, and in none of which has there been any more serious consequence than moderate urethral fever, which has yielded to the hot bath and the exhibition of opium and quinia internally.

At the same time, it has been evident that the instrument, as originally proposed by Mr. Holt, possessed certain defects, and could be modified to advantage.

Others, as well as myself, soon discovered that the expansive power of the instrument was insufficient; that even when the largest tube was employed, there were some strictures which would merely stretch as it passed without

being ruptured, and would afterwards tend strongly to return to their former condition. The remedy for this was evident, viz., to allow wider separation of the blades and employ larger tubes. This modification has sufficed for the purpose in most cases, although not in all. In one of the above twenty-five cases I employed the largest sized tube, with the immediate effect of being able to introduce No. 23 (French) sound, but, at the end of forty-eight hours, No. 17 was still firmly "held" by the stricture, situated at the bulb, when I had recourse to internal division with Maisonneuve's urethrotome, and no tendency to recontraction has appeared up to the present time—five months since operation—the patient still continuing his visits for the purpose of observation.

But there was still another objection to Holt's instrument. The size of its point, which equalled No. 7 of the French scale, or No. 1 American, rendered it impossible to use the instrument in very narrow strictures until, by the successive introduction of filiform bougies, the requisite calibre had been attained; and even then the curve of the instrument was such that its insertion was not always an easy matter. Thus after dilating the stricture with bougies up to No. 7 (French), I often found considerable difficulty in introducing a Holt, especially as the shaft of the instrument rapidly increases in diameter, so that practically a much greater degree of dilatation than No. 7 is required for its insertion to such an extent within and beyond the contraction as to enable us to use it for the purpose intended. This is evident on inspecting the instrument, which will be found to require a calibre of No. 11 (three and two-thirds millimetres=No. 4 American scale) in order that the introduction of either of the tubes alongthe central wire may have any effect upon the stricture.

To obviate this difficulty, Mr. Stohlmann, of the firm of Messrs. Tiemann & Co., at my request, changed the curve of the instrument, so that it should correspond to what is known as Thompson's curve. I also directed that the point should be made separate, so that it could be unscrewed, and in its place a filiform bougie could be attached, which should possess all the advantages of the conducting bougie of Maisonneuve's urethretome, and enable me, with a little time and patience, to insert the instrument to the requisite extent in any case of stricture which was at all passable, and at a single session. Again, the central wire is made hollow, and in fact consists of a tube, the vesical opening of which terminates near the extremity of the instrument, anterior to the screw-point, so that the flow of urine may indicate when the bladder has been entered. This, however, is a minor consideration with the bougie attachment, since any deviation from the proper course is now almost impossible. These modifications have been found to accomplish all that was desired, and will, I believe, materially increase the value of Mr. Holt's instrument.

I would add that the same bougies may be made to fit on to both Holt and Maisonneuve, so that the choice of the instrument need not necessarily be determined until after the conductor has been passed.

Thebaud's Instrument.—The instrument for the rupture of strictures, invented by my friend, Dr. Julius S. Thebaud, of this city, has not, I believe, been before described. In shape it corresponds to an ordinary sound, but the extremity of the instrument is split horizontally for a distance of about five inches, forming two blades, which are separated in a vertical direction by turning a screw in the handle. There are two sizes; the point of the smaller has a diameter of four millimetres (No. 12 of the French scale); that of the larger, one of six and two-thirds millimetres (No. 20 of the French scale); hence it is evident that the instrument cannot be used in tight strictures without preliminary dilatation or incision. In using the instrument, the extremity is passed fairly through the stricture, when the screw at the handle is turned until the contraction is felt to "give," or the desired amount of dilatation is effected, as indicated by a scale marked on the screw shaft.

This instrument is one of very great power and capacity. The larger one is capable of rupturing a stricture to a size much exceeding No. 30 of the

French scale (No. 18 American). By measurement this power equals a sound of five-eighths of an inch in diameter. Compared with Holt, Thebaud's instrument has therefore the advantage of any desirable amount of dilating and rupturing power, and the disadvantage of not being adapted to tight strictures. The extreme power may render its use dangerous in unskilful hands; and there is the further objection that it requires some care to determine when the stricture is accurately caught to its full extent near the point of the instrument. Still, it is remarkable with what impunity the urethral walls will bear the apparent amount of violence which this instrument can exercise. I have used it in some fifteen to twenty cases, and Dr. Thebaud himself in about double the number, without unpleasant consequences. In one of those rare cases of pure spasmodic stricture which we sometimes meet with, I assisted Dr. Thebaud in introducing his larger instrument into the membranous portion of the urethra, and opening their blades to the fullest extent. The operation was performed on the same principle as leads us to rupture the sphincter ani in irritable conditions of the lower portion of the rectum. The tissues were felt to suddenly yield, doubtless in consequence of their rupture, but there was no subsequent chill, fever, undue hemorrhage, incontinence of urine, or other unpleasant consequence, and the patient was about attending to his business the following day. The spasmodic action was entirely relieved for over a year, but, as I have learned, subsequently returned. For a case of this kind no other instrument that I know of would have served the purpose.

I have found Thebaud's instrument of special value in cases like one before mentioned, in which the stricture had not been sufficiently ruptured by the use of Holt.

Before leaving the subject of instruments intended for the rupture of stricture, it is proper to refer to Mr. Thompson's instrument, although its inventor designed it rather for the rapid dilatation than actual rupture of the constricting band. I have not as yet made use of this instrument, but the principle of it is excellent, and I should judge it to be of great value whenever a timid patient refuses to submit to what appears to him a more violent procedure. It is evident that the dilatation may be carried to the point of rupture, and thus the same effect be produced as with either of the above-named instruments.

Maisonneuve's Urethrotome.—This instrument is now too well known to require description, and the reader of our current medical literature must have observed the numerous favourable notices of it, emanating from various sources, which have appeared during the last few years. In my own opinion, it is by all odds the simplest and the best urethrotome ever invented. Its filiform attachment enables it to be used in every stricture, however tight, through which the finest bougie can be passed; the bluntness of the apex of its triangular-shaped blades is well adapted to prevent any sound portion of the canal being wounded; and its simplicity renders it easily cleansed, and little liable to get out of order.

I desire to call attention especially to the first of these advantages which is also shared by my own modification of Holt, as before described. A patient comes to your office with what appears at first to be an impassable stricture. After a while, however, you succeed in engaging the point of the filiform extremity of one of Maisonneuve's bougies within the contraction. Your patient is allowed to remain for half an hour, when the bougie will enter still further, and thus by the process of what has been called continuous dilatation, the apparently impassable stricture is soon enlarged sufficiently for the full and free passage of the fine bougie. This is now screwed to the end of the metallic shaft of Maisonneuve or Holt, which by the aid of one finger in the rectum may now be guided into the bladder, within which the bougie-conductor coils itself up as the shaft advances. It remains only to thrust down the knife or tube, as the case may be, and your patient is relieved of his stricture before leaving your office. This may seem to be making light of a serious operation, but it is what I have often done, especially with patients from a distance, whose stay in the city was necessarily limited. A

hackney coach may be called to take the patient to his lodgings, and twenty-four hours' quiet in his room is usually sufficient.

[After the operation, the parts should be interfered with as little as possible for the first few days. Either before the operation or immediately afterwards, it is a good plan to divide the meatus a little so as to allow of the use of the largest-sized sound.]

I am not over sanguine with regard to the permanence of the cure after any mode of treatment, in the absence of prolonged attention, It is true that I have still patients under observation, operated upon four or five years ago, in whom there is no tendency to relapse, as shown by the size of the stream and the freedom with which a sound may be passed. But from what we know of the pathological anatomy of strictures, and from the evidence afforded by casts of the canal some time after the passage has been freely opened, it is evident that the tissue of new formation does not entirely disappear even on the supposition that it is materially diminished. Moreover, cases will return to disappoint us when we had hoped for better things.—*American Journal of Medical Science, Oct.* 1868, *p.* 321.

70.—ON SPASM OR EXCESSIVE CONTRACTION OF THE MUSCULAR COAT OF THE URETHRA, COMMONLY CALLED SPASMODIC STRICTURE.

By William S. Savory, Esq., Surgeon to St. Bartholomew's Hospital.

[Since it has been known that the urethra in its entire course is invested by muscular fibre, it has been admitted that spasm may occur in any portion of the canal. The opinion, however, seems very common that the so-called compressor urethra muscle is the chief agent in the production of spasmodic stricture, and that it is, therefore, usually limited to, and always most intense at the membranous portion of the urethra. But this view is not borne out either by observation or analogy.]

That spasm or muscular contraction of any degree is in its very nature transitory there can be no doubt; but yet cases occur in which all the symptoms of stricture endure for years, but in which, nevertheless, there is clear evidence to show that it entirely depends on muscular contraction.

In the following case the spasm very closely simulated organic stricture.

A man between thirty and forty years of age, whose health for some time previously had been unsatisfactory, complained of considerable difficulty in passing urine. Very much straining was needed to relieve the bladder, and then the urine only in part escaped in a very slender stream, and the rest dribbled away. The gentlest introduction of any instrument always gave acute pain, and the point was arrested at a variable distance, but usually within some four or five inches of the orifice. So sensitive was the urethra that the canal could not be fairly examined without chloroform, and even then, on almost every occasion, the instrument was arrested before it reached the bladder. Only once or twice was this accomplished in the earlier part of the case, and then an instrument of moderate size—No. 7 or 8—was carried through with facility. This state of things endured for many months, and it was observed that the condition of the urethra always varied with the general health. Now and then, to the man's astonishment, the urine would pass freely in a full stream, but in spite of every apparent precaution the amendent was only transitory; in a few hours the difficulty and distress was as great as ever. After a time all attempts to pass an instrument were given up except when some fresh surgeon was consulted, who of course did not believe in the difficulty until he himself had made an unsuccessful attempt to overcome it. Then, sometime after the urethra had been left to itself, the symptoms gradually abated. The first indication of improvement was that during a loose action of the bowels, after aperients, the urine would escape in a full stream without difficulty. At times a tolerably free stream would

flow for days together, and then again, perhaps from some indiscretion in diet, the condition of parts would become as distressing as ever. Even to the last any attempt to introduce an instrument was always unsuccessful and mischievous. But at length the evil gradually abated, and for the last year or two the urine has been passed freely in a full stream.

In the Lancet of April 13, 1867, Mr. Campbell De Morgan has recorded a case of what may well be called permanent spasmodic stricture, inasmuch as it was of some twenty years' duration.

The explanation of these and of many other cases more or less persistent and unyielding, I take to be this: The muscular coat of the urethra cannot always be in a state of spasmodic or inordinate action, but is immediately excited to contract unduly by any impression upon the mucous membrane of the urethra or adjacent parts: so the contact of urine, or still more of an instrument, at once provokes it. Thus, as the canal is almost always more or less contracted by the passage of urine, and still more completely closed by any attempt to pass an instrument, evidence of stricture always exists when its condition can be examined, and thus, so far as every appearance is concerned, the contraction is persistent, but in all probability there is in intervals of complete quietude more or less complete relaxation.

The influence of chloroform is sometimes very great in these cases, and its value twofold—in diagnosis and in treatment. It is not always, however sufficient to cause thorough relaxation of these muscular fibres.

When spasm is associated with organic contraction or inflammation or congestion, either alone, or still more when combined, it may be reasonably assumed that the cause of it is obvious enough; but if spasmodic stricture may and often does occur independently of any of these, the question arises—To what cause may spasm, thus pure and simple, be due?

The exciting cause of simple spasm may be either in the urethra itself, or it may arise in neighbouring or even in distant parts. A common example of the former class is the spasm which is often provoked by the introduction of an instrument. Everyone knows how the effect is increased by clumsy manipulation, and how the difficulty is often averted by attention to the temperature of the instrument, and, better still, by gentleness and lightness of hand. As before mentioned, the difficulty may be often escaped, too, by rapidly carrying the instrument into the bladder, taking the urethra, if one may so speak, unaware. So, again, the distress, which frequently follows the employment of irritating injections, or the passing of irritating urine, as sometimes after the application of a blister, are examples of the same kind. As illustrations of the latter class may be mentioned the spasm associated with inflammation of the prostate, and that which is often induced by some affections of, or operations on, the rectum, or even by fracture of the leg. The degree to which these several exciting causes may act will of course depend upon the disposition of the urethra itself.

If I may venture to speak in general terms, I would say that, in the treatment of cases of stricture, the rule should be to try first what can be done by other measures before resorting to mechanical means. The introduction of an instrument may be indeed necessary in the first instance as a means of diagnosis; often enabling us moreover, by observing its effects, to determine whether it shall be employed, and if so when, in the further treatment of the case.

It need hardly be remarked that in the treatment of spasmodic stricture when not associated with any morbid change in the part—when pure and simple—the cause of it, whether direct or indirect, must be sought for, and if possible removed.

Beyond the all-important means of rest and recumbency and warmth in the form of baths or otherwise, there are, we know, remedies which have powerful action in directly subduing spasm—chloroform for instance, which in cases of emergency will sometimes signally succeed, and enable us without difficulty to pass a catheter through an urethra which just before had proved impermeable. Opium, which in these cases is so often an invaluable remedy, as a rule perhaps is best administered as laudanum by the rectum; but this or

some other form of it, whether solid or fluid, may be given by the mouth, or morphia may be injected under the skin. Belladonna, too, or its alkaloid atropine, is sometimes useful, especially when locally applied; but, as a rule, I think they bear no comparison in efficacy to opium.

Active aperients, too, are often strikingly serviceable. The urine, which, up to the period of their action had been obstinately retained, will sometimes pass freely during a sharp action of the bowels. The escape of urine, which is often simultaneous with the action of the bowels, and usually then most free, is a fact which should be always borne in mind. And it may be remarked that the success which attends the use of such remedies as those which have been indicated is an additional proof, and a strong one, of the nature of the case. But, let it be repeated, we should, whenever it is practicable, go farther than this in our treatment of spasm of the urethra, and discover if possible the cause on which its occurrence depends.

Even when spasm is associated with structural change or organic stricture, it may be controlled by the same means, more or less actively employed according to circumstances, although of course their effects are not now so striking or apparently satisfactory. When there is evidence of further mischief in the form of inflammation or congestion, local depletion or perhaps counter-irritation by other means than the application of cantharides may be advisable. But except in extreme and very urgent cases the use of drugs and of all active remedies may well be dispensed with, and reliance placed on simple measures of hygiene, such as wholesome food, warmth, and, above all, rest for a while even in bed.

In conclusion, it is only right to state that the substance of this paper was written more than five years ago, and that further experience during this period has confirmed the opinions I have ventured to express. However faulty these opinions may be, they are therefore hardly open to the charge of hasty publication.—*St. Bartholomew's Hospital Reports, Vol.* 4, 1868, *p.* 21.

71.—ON THE MEDIO-LATERAL OPERATION FOR LITHOTOMY.

By Henry Lee, Esq., Surgeon to St George's Hospital.

[Mr. Lee first performed the operation described, in October, 1867, and three months afterwards, saw an account of Sir W. Fergusson's operation by a semicircular external incision.]

The medio-lateral operation is performed in the following way:—

The patient is placed in the ordinary position for lithotomy, and a grooved staff having been introduced, the skin of the scrotum is held moderately tight by an assistant. An incision is then made in the median line of the perineum; this should extend through its posterior half terminating to or three lines in front of the anus; from this point the incision is continued for a quarter of a circle round the front and left side of the rectum. The finger of the left hand may then be put into the wound and the rectum pressed back whilst an additional touch or two with the knife separates it still farther from the parts in front. The forefinger of the left hand is now passed into the rectum, and the knife, with its back towards the bowel, is passed, at the posterior part of the central incision, into the membranous portion of the urethra. With the finger as a guide this is done with great ease and certainty; a bistoury or knife with a probe at its extremity is then passed into the same opening, and made to slide along the staff into the bladder. The blade of the knife is then directed towards the patient's left side and somewhat backward, and as it is withdrawn the heel of the knife passes in the direction of the original incision through the skin; the point of the knife remains very nearly in the median line; a free external incision is thus produced involving no important parts, with a small opening into the bladder. The urethra being opened in the median line is reached with the greatest facility with the finger, and the incision into the bladder is in the same way very easily dilated.

The forceps, or any other instruments that may be used, are also introduced more directly into the bladder than in the ordinary lateral operation.

In this operation all the usual accidents and difficulties which are likely to occur in lithotomy are guarded against. With the finger in the rectum as a guide the urethra may be opened without difficulty, and the probe-pointed bistoury being guided by a grooved staff cannot well fail to enter the bladder.

The incision into the prostate gland is made from within outward, and this I consider an advantage. An incision made in the opposite direction partakes more or less of the nature of a stab, and the point of the knife, even when guided by the most skilful hand, will sometimes wander from the groove in the staff. I suppose that there is no operator of experience to whom this has not happened. It is an accident which, when it does occur, may generally be easily remedied; but still it is one which has led to very unpleasant results, and one which every operator would gladly avoid if possible.

The medio-lateral operation for lithotomy is performed in far less time than it requires to describe it, and I have been surprised, in operating both upon the dead and living subject, with what facility it is accomplished. The instruments which I have used are an ordinary staff grooved in the median line, a common narrow scalpel cutting on one side only, and a curved bistoury with a probe projecting two lines beyond the termination of its cutting edge.

In addition to the case just mentioned two others have recently come under my care, in which I performed the medio-lateral operation.—*St. George's Hospital Reports, Vol.* 3, 1868, *p.* 27.

AFFECTIONS OF THE EYE AND EAR.

72.—ON THE TREATMENT OF THE THREE MOST TROUBLESOME FORMS OF PURULENT OPHTHALMIA.

By George Lawson, Esq., Surgeon to the Royal London Ophthalmic Hospital, Moorfields.

Purulent Ophthalmia of Newly-born Infants.—The indications for treatment are to wash away the discharge from the eye as often as it collects, and to use some astringent lotion to arrest the re-secretion of the purulent matter. Lotions of alum, or of sulphate of zinc and alum, and drops of nitrate of silver, are the most useful astringents in purulent ophthalmia. The lotion which I generally use is one of aluminis gr. vj ad aquæ ℥j. The mode, however, of applying the remedies is of as much importance as the remedies themselves. The lotion should be gently squirted into the eye with an india-rubber syringe with an ivory nozzle, or with a small glass syringe, every half hour or hour, according to the severity of the case, the object being to thoroughly cleanse the eye from all discharge as often as it is re-secreted. This treatment should be pursued by night as well as by day. The intervals between the use of the lotion may be increased, as the discharge decreases in quantity. The carrying out of these instructions, should be intrusted solely to the nurse, as the mother so soon after her confinement is unfitted for the duty, and rest is also essential for her in order to insure a due supply of milk for the child. The easiest way of applying the lotion is as follows: the nurse should lay the child on her lap, turning its head a little to one side or the other, according to the eye she is going to wash out. With the thumb and finger of her left hand she gently separates the lids, whilst with the right hand she squirts a stream of the lotion into the eye from the nasal side, allowing it to run away from between the lids on to a soft napkin which she has placed under the child's head to receive it. If the case is very severe the surgeon should see the child once or twice a day himself, and having first washed the eye thoroughly from all discharge with a stream of cold water, he should drop into it two or three drops of solution of nitrate of silver, gr. ij, ad aquæ ℥j, and order the alum lotion to be continued as directed during

his absence. In some cases where the nurse is very awkward, and cannot rightly use the lotion with a syringe, it may be efficiently applied by means of a soft camel hair brush. From time to time a little unguent. cetacei should be smeared on the edges of the lids to prevent their gumming together.

Purulent or Contagious Ophthalmia.—It has been called also *Egyptian Ophthalmia*, from its being ever present in Egypt, where the most severe types of the disease are to be constantly found. The characteristics of this disease are that it is purulent and contagious. In its mild form it closely resembles catarrhal ophthalmia, for which indeed it may be mistaken; but in the worst cases it almost equals in severity the gonorrhœal affection of the eyes. The peculiar tendency of purulent ophthalmia is to attack masses of people who are congregated together, and living without due attention to cleanliness and ventilation. Hence it is that this disease has frequently broke out amongst soldiers in barracks; amongst the poor in workhouses, and in large pauper schools in the country. Although purulent ophthalmia is undoubtedly propagated by inoculation, yet there is abundant evidence to show that it may be epidemic, and spread without any direct conveyance of the purulent secretion from eye to eye.

Treatment.—In all outbreaks of this disease sanitary precautions should be at once taken to prevent it spreading, and the bad cases should be kept apart from the others. A daily inspection should be also made of those who are living in the same community, in order to treat each fresh case as soon as the early symptoms show themselves. A mild case of purulent ophthalmia may be treated with a lotion of aluminis gr. iv, ad aquæ ℥j; or with zinci sulphatis gr. j, aluminis gr. iij, aquæ ℥j; which should be used every two or three hours, the patient taking care that with each application a little is allowed to run into the eyes. In the intervals between using the lotion, the eyes may be frequently bathed with cold or iced water, to keep them free from discharge. A solution of nitrate of silver, gr. j or gr. ij, ad aquæ ℥j, is very useful, and especially in those cases where there is much chemosis of the conjunctiva, or swelling of the lids. To prevent the gumming together of the eyelids during sleep, a little unguent. cetacei should be smeared along their tarsal borders every night.

At the commencement of the attack the bowels should be well acted on by some purgative, and, if the patient is hot and thirsty, an alkaline or effervescing draught may be prescribed; but as a rule, tonics, such as quinine, iron, or bark, will be required, and these should be continued during the progress of the ophthalmia. The disease is very depressing, and the tendency to ulceration and sloughing of the cornea is increased as the vital energies of the patient are lowered.

If the purulent ophthalmia is very severe, the plan of treatment recommended for gonorrhœal ophthalmia in the next section, should be pursued.

After the severity of the disease has been arrested, there is apt to remain a muco-purulent discharge, which will often obstinately resist all treatment for many weeks, or even months. For this condition I have frequently found much benefit from the use of a few drops of zinci chlorid. gr. j, ad aquæ ℥j, dropped twice a day into the eye. When this chronic discharge is persistent, the upper lids should be everted, and it will then be frequently found that it is due to a granular state of the palpebral conjunctiva, induced by the disease. This granular condition of the lids is one of the most frequent results of purulent ophthalmia, and one of the most intractable diseases the surgeon can be called upon to treat. Without entering upon the numerous remedies which have been tried and vaunted as certain cures, I will only state the one mode of treatment with which I have had the most reason to be satisfied. It is the application of a strong solution of nitrate of silver, varying in strength, according to the severity of the case, from gr. v to gr. xx, ad aquæ ℥j, and, after waiting thirty or forty seconds to allow it to take full effect, washing off the surplus with a stream of cold water, or with a weak solution of common salt and water.

The way in which the solution should be applied is as follows: The patient is to be seated in a chair, and the surgeon, standing behind him, with a probe

everts the upper lid so as fully to expose the palpebral conjunctiva, over the surface of which he paints with a camel's hair brush the solution of the nitrate of silver, taking care to apply it thoroughly to the reflection of conjunctiva which forms the oculo-palpebral fold. After waiting for about half a minute, he then, with a syringe, gently squirts over the granular surface a stream of cold water, or what is better a solution of common salt of about the strength of gr. x, ad aquæ ℥j, to wash away and neutralise all the surplus nitrate of silver, so as to prevent its irritating the eye, or blackening the ocular conjunctiva, a misfortune I have seen occur when strong solutions of the caustic have been frequently used without taking these precautions.

GONORRHŒAL OPHTHALMIA is an acute specific inflammation of the conjunctiva of the lids and globe, induced by the inoculation of some gonorrhœal matter into the eye. It is characterized by a profuse purulent discharge from between the lids, which is of a yellow colour, and exactly corresponds in appearance with that which flows from the urethra. The disease is rapid in its progress, and very destructive; unless it is soon checked, the eye is lost.

Treatment.—A few years ago the treatment consisted in excessive bleedings from the arm, and in the use of strong depressing medicines. Experience has shown the error of such proceedings, and by now adopting a directly opposite course, a far larger proportion of cases recover with good and useful eyes. In gonorrhœal ophthalmia the treatment must be constitutional and local.

Constitutional Treatment.—From the very commencement of the attack the strength of the patient must be supported by tonics, diffusible stimuli, and a liberal diet. The whole history of a gonorrhœal ophthalmia is of a depressing character. The patient, generally suffering from gonorrhœa at the time the eyes become inoculated, is, from the nature of his complaint, and the treatment adopted to cure it, below the standard of health. The disease itself is also very exhausting; but the prospect of loss of vision, with the utter annihilation of all future prospects, adds to the sense of loneliness and despair. The fact that the patient is suffering from a severe urethral discharge, will not forbid the free use of tonics and stimulants. The danger of ulceration and sloughing of the cornea is increased as the vital powers are depressed. Having therefore first acted freely on the bowels by a moderate purgative, quinine in 2 gr. doses, or cinchona with the mineral acids, should be given every four hours. If there is much pain or irritability, opium should be prescribed, either in small quantities frequently repeated, or in one full dose at bed-time. When there is heat of skin, with thirst and a furred tongue, an effervescing mixture with ammonia may be advantageously ordered before prescribing the direct tonics. The diet should be one with meat or beef-tea, and with a certain amount of wine or brandy, according to the strength of the patient.

Local Treatment.—The best applications are nitrate of silver, lotions of alum, or sulphate of zinc and alum, and cold.

1. *Nitrate of Silver.*—This is best used in the form of solution, varying in strength from gr. x to gr. xxx, ad aquæ ℥j, according to the severity of the case. The lids should be everted, and the conjunctival surfaces painted over with the solution, which should be allowed to remain a few seconds, so as to whiten the parts, and be then washed off in the manner described before.

This should be repeated once daily, and in very bad cases a second application may be necessary. When the lids are so swollen that they cannot be everted, two or three drops of a weaker solution of nitrate of silver, from gr. ij ad gr. x, ad aquæ ℥j, may be dropped twice a day into the eye, after it has been first cleansed by syringing away the discharge with cold water.

2. *Lotions of Alum.*—Gr. vj, ad aquæ ℥j, or of sulphate of zinc and alum, of the proportions mentioned at page 174, should be used at least once every hour to wash away the discharge as often as it accumulates. The lotion should be gently injected over the surface of the globe with a syringe or india-rubber bottle, so as thoroughly to wash away all purulent matter at each application.

3. *Cold* is very grateful to the patient, and may be applied during the intervals between using the lotion, by placing a fold of lint, wet with iced water, over the eyelids, and changing it as often as it becomes hot or dry. The patient may also be allowed to wash away the discharge as fast as it exudes from between the lids with a piece of linen dipped in the iced water. By a steady perseverance in this line of treatment the best chance of saving the eye is afforded to the patient, but the disease is frequently of so virulent a character, that in spite of all remedies, and the most judicious management, the cornea sloughs, and the eye, for all useful purposes, is irretrievably lost. —*Practitioner*, *Dec.* 1868, *p.* 338.

73.—ON THE TREATMENT OF GRANULAR OPHTHALMIA AND PANNUS BY INOCULATION.

By J. G. Hildige, Esq., Surgeon to the National Eye and Ear Hospital.

The following cases, treated at the National Eye and Ear Hospital, show the efficacy of inoculation as a remedy for the cure of the above diseases, when all other means had proved unavailing.

Case 1.—Ellen B., aged seventeen, of a healthy and tolerably strong appearance, applied for medical advice under the following circumstances: She stated that when she was four years of age her eyes commenced to be affected, and ever since that time, during a period of thirteen years, she had been almost continually under medical treatment, her sight being occasionally so bad that she was obliged to be led about. On examination I found the cornea of each eye extremely vascular, and so opaque that it was with difficulty she could discern large objects placed near her. The mucous lining of the upper eyelids was covered with granulations and much thickened; it also showed signs of long-continued treatment. She suffered considerably from pain in the eyeballs and temples, which from time to time became so severe, particularly at night, that sleep was completely banished from her pillow. As the usual remedies were followed only by temporary improvement, and as she had been suffering so long from the disease, I resolved to have recourse to inoculation, a remedy which I had seen elsewhere employed with the best possible results, and which was not contraindicated in this case. The pus was taken from the eye of an infant suffering from acute purulent ophthalmia, and was introduced by means of a camel hair-brush between the girl's eyelids. After the expiration of twenty-four hours considerable irritation, accompanied by pain, set in, and at the end of forty-eight hours both eyes were suffering from an acute attack of purulent ophthalmia. Active antiphlogistic treatment was employed, the disease ran a favourable course, and at the end of fourteen days the inflammatory symptoms had subsided, leaving both corneæ perfectly sound, and showing indications of commencing improvement. Three weeks later both corneæ had become so transparent that the patient could read large type; and at present, four months from the day of inoculation, her eyes are perfectly sound, and her sight so good that she can read small type and see distant objects more distinctly than ever she remembers to have done in her life.

Case 2.—Eliza S., aged fifteen, apparently of a healthy and strong constitution. She had suffered from granular lids and pannus of right eye for a period of three years, during the greater portion of which time she had been under medical treatment. The cartilage of the upper eyelid was hypertrophied, and its mucous lining, which was covered with granulations, was much thickened and altered in structure. The cornea was vascular and opaque, so that the eye was almost useless to her. The left eye presented no trace of disease, but the sight of it had become much impaired from sympathetic irritation. This patient was inoculated at the same time as the preceding one, the left eye having been previously bandaged; and after a period of three days acute purulent ophthalmia, accompanied by considera-

ble constitutional irritation, set in. The disease ran its course in about fourteen days, leaving the cornea perfectly sound; and at the end of ten weeks she could read ordinary-sized type with ease and see distant objects.

Case 3.—Mrs. B., aged forty-five, of a somewhat delicate appearance. She had suffered from granular lids for several years; both corneæ were, however, perfectly transparent. Her sight was extremely bad, owing to a lesion of the retina which had existed for some time, and which was slowly progressing. She was inoculated with pus taken from a patient suffering from blenorrhea. A slight attack of purulent inflammation followed after a period of forty-eight hours. At the end of three weeks the attack had passed away, destroying every trace of granulations, and leaving both corneæ intact.

Case 4.—John B., aged ten, of a strong and healthy appearance. He had suffered for six months from granular ophthalmia, complicated with hypertrophy and ectropium of the eyelids of both eyes. The corneæ were perfectly transparent. Not wishing to resort to inoculation before making a trial of other remedies, I excised a portion of the diseased membrane from the internal surface of each lid, and afterwards cauterized the parts with the solid nitrate of silver, a pad and bandage being placed on each eye in order to retain the parts *in situ*. This mode of treatment was continued for some time, but was not attended with any permanent benefit, so that I determined to treat the case by inoculation. A severe attack of purulent ophthalmia followed the application of the pus; it yielded, readily, however, to treatment, so that at the end of ten weeks every vestige of the disease had disappeared, the ectropium being completely removed and the boy's vision excellent.

I have treated other cases of opacity by this means, and with the same beneficial results; and I consider that it may be safely resorted to in every case of granular ophthalmia, except when it is contra-indicated by a strumous or syphilitic diathesis, in which cases diphtheritic inflammation would be the inevitable result.—*Dublin Quarterly Journal, Feb.* 1869, *p.* 78.

74.—LACRYMAL OBSTRUCTION.

By Robert B. Carter, Esq., Consulting Surgeon to the Gloucestershire Eye Institution.

It is well known to practitioners that lacrymal obstructions depending upon stricture of the nasal duct, below the sac, are often of a very obstinate character. In some cases, when the canaliculus has been slit up, and Bowman's largest probe passed through the stricture, the difficulty is soon overcome. In others, and I think they form a majority, the stricture soon closes again, and the malady becomes as troublesome as ever. All manner of devices have been tried in vain; and such patients become a source of unmixed weariness at the hospital, and of weariness mitigated by guineas, in the consulting-room. Cat-gut probes, laminaria probes, injections of all sorts and in all quantities, styles to be worn temporarily, and styles to be worn permanently, form only a few of the resources that have been tried, sometimes successfully, but yet with frequent failure even in skilful and practised hands. And, if these probings and manipulations were ever performed unskilfully, it could scarcely be expected that benefit would be derived from them.

Nearly at the same time, Dr. Ulrich Herzenstein, of Vienna, and Dr. Stilling, of Hesse Cassel, put forth the suggestion that the difficulty in these cases was due to the fact that the instruments in common use were not large enough to dilate the nasal duct effectually. The bony channel of the duct is about three times the diameter of the largest of Bowman's probes; and hence this probe can scarcely be an efficient dilating agent within its walls. Both Herzenstein and Stilling sought for improved resources in the modern methods of treating stricture of the urethra. The former adopted the plan of splitting; the latter, the plan of internal incision. Herzenstein's instruments are, on a small scale, like those of Mr. Bernard Holt for the

urethra; and their employment is said to have been attended with success. I have no practical knowledge of them; but the method by internal incision I have now used sufficiently often to form some estimate of its value.

Dr. Stilling has contrived a knife (made by Weiss and Son) for his operation, somewhat resembling a small tenotome, rounded at the point, with a sharp cutting edge and rounded back, the blade about three quarters of an inch long, rather wider at the heel than at the point, and inserted into an ivory handle by a steel stem of such a length that the ivory handle is above the canaliculus when the point rests on the floor of the nose. This knife may be used to slit up the canaliculus, and may then be carried on in the same way as an ordinary probe; or the probe may be used first, to ascertain the position and measure the resistance of the stricture. The knife being fairly in the nasal duct, and its point on the floor of the nose, the resisting structures in the duct are to be freely divided, up to the bony wall, in three or more directions, until the blade is felt to be free in the duct, and can be turned round or moved up and down, without encountering resistance. The knife may then be withdrawn, and the fact of its having been in the nose may be tested by a probe; but generally there will be sufficient bleeding from the nostril to remove all doubt upon the point.

According to Stilling's experience, no other treatment than this is required. The incisions will be followed by a little swelling of the parts cut, so that the passage may be occluded for a time. But in the course of a day or two this swelling subsides, and no disposition to contraction remains. I have now performed the operation on four patients; and, with regard to three of them, sufficient time has not yet elapsed thoroughly to test its effects, although they are so far satisfactory. But in the case of a gentleman who had been suffering from obstruction for a long period, and for whom a probe had been passed at regular intervals, with only temporary benefit, a radical cure appears to have been brought about by the single operation. The probe now glides into his nose without encountering any obstruction, the tears pass away freely, and there is nothing left to remind him of the malady that was once a source of daily and hourly annoyance.—*Practitioner*, *Jan.* 1869, *p.* 24.

75.—UPON AN IMPROVED METHOD OF EXTRACTION IN CASES OF CATARACT.

By Dr. Charles Bell Taylor, Surgeon to the Nottingham and Midland Eye Infirmary.

[In the year 1865 Dr. Taylor drew attention to a method of extraction in cataract, which he had found successful in several unpromising cases. (*See Retrospect*, vol. li., p. 284.)]

The instruments that I employ are a pair of sharp forceps that pierce the sclerotic, a very light speculum (a modification of Von Grafe's), and two knives, a line in width and bent at an angle similar to the ordinary iridectomy knives, one with a sharp point, and the other with a blunt or bulbous extremity.

As the danger, even if vomiting occurs, is very slight with the form of incision I am about to describe, I usually prefer to have the patient narcotised, and, as a rule, push the chloroform to full anæsthesia. The lids should then be kept apart by the speculum, and the globe gently depressed with a pair of ordinary forceps in the operator's right hand. Having got the eye into a favorable position, it should be fixed by the sharp forceps at about the junction of the upper with the middle third of the cornea. The pointed knife is then entered in the corneo-sclerotic junction, one or two lines from the forceps, at the summit of the cornea, pushed well into the anterior chamber, and, with a gentle sawing motion, the eye being steadied with the left hand, carried along the summit a distance of three lines. The aqueous will now escape, and if we wish to extract without iridectomy, or if the condition of the globe before and after incision, as regards tension, is such that

we have reason to fear excessive bleeding from excision of a portion of iris, it will be well at this stage to open the capsule carefully in its central and lower segments, a proceeding very much facilitated by the small size of the wound, the safety with which the globe may be manipulated, and a previously dilated pupil. If the cornea remains firm, if the lens is readily loosened on incision of the capsule, if the patient is perfectly quiescent, shows no tendency to vomit, and other circumstances prove favourable, we may extract without iridectomy, in which case it will be simply necessary to enlarge the wound in the manner hereafter to be described.

If, from the nature of the case, we have decided on associating an iridectomy with the extraction, and desire to derive the advantages of an iridectomy, so far as tension is concerned, the iris forceps should now be introduced into the wound, the blades opened, and the iris seized near to its pupillary border, drawn out, and divided at the right hand angle of the incision, carried over and excised at the left as in iridectomy for glaucoma. If, however, tension is quite normal, and the removal of a portion of iris is not likely to have a favourable influence on the after-progress of the case, a very small incision, or the merest slit in the constrictor fibres of the iris, will suffice to reduce the risk from bruising to a minimum, and still to some extent preserve the advantages of a natural pupil. If we have not found it necessary to open the capsule prior to iridectomy, it should now be rendered tense and carefully incised with the ordinary cystotome, the stem of which it is as well to have made either of platinum or soft steel, so that it may be bent in accordance with the projection of the patient's brow, or relative position of the eyeball. Having opened the capsule, and slightly loosened the lens, the eye should be seized to the right of the globe with a pair of ordinary forceps, and the wound enlarged to the left with the blunt-pointed knife (encroaching slightly upon the sclerotic to an extent that experience tells us, will, with a similar wound to the right, suffice for the ready exit of the lens); fixing the eye then with the left hand, the process must be repeated to the right. The incision is thus localized in a definite line, and its extent at any period of the operation is only limited by the will of the operator.

If the iris has been left intact, a comparatively large flap will be required, but if iridectomy has either preceded or is associated with the extraction, a very small shallow flap will suffice, one which yields readily to the advancing lens, while it is sufficiently slit-like and elastic to close without artificial apposition or external support, strong enough to resist protrusion by advancing vitreous, and too resilient to permit of accidental reflection.

The lens may now be extruded by slight pressure upon the globe, without passing any instrument into the eye, cortical fragments removed with ease, and any portion of capsule or lens matter likely to obstruct vision, be either torn across or removed with the sharp hook, canula forceps, or sucker.

If, from the existence of firm adhesions, the lens cannot be started by pressure, it should be dipped out with the wire-loop spoon, an instrument which from its extreme tenuity assists the exit of the cataract without adding to its bulk.

If it is desirable to extract by the lower section, the same form of incision may be employed, and this is preferable in a few cases where the lens is superficially softened, as any pulpy cortical matter left behind in the eye will gravitate to the bottom of the anterior chamber, pass harmlessly through the coloboma iridis, and either undergo absorption, or be washed out with the aqueous. The risk of its lodging behind the lower segment of iris and setting up subsequent irritation is thus avoided, but the section is less sheltered, and the coloboma uglier and more disturbing to vision.

The operation completed, I apply a drop of solution of atropine in the corner of the eye, and cover the lids with a pad of fine cotton wool, dipped in, but not saturated with cold water. If sodden, the pad is heavy, irregular, unmanageable; but just moistened on the surface, it fits accurately into the orbital cavity, and speedily dries into a smooth film, closely bedded to the surface of the lids, absorbing moisture, insuring equable support, a regular

temperature, and the exclusion of light. It must be secured *in situ*, with gentle pressure, by thin strips of soap plaster, spread on unglazed calico (which adheres without warming). I find this by far the best dressing. Pressure can be accurately applied by strips fixed to the forehead and cheek, and if necessary, by an additional broad strap passed from temple to temple. Any kind of compress bandage may also, if required, be readily applied over the pads and plaster. Inflammatory or other complications coming on after the operation must be treated on general principles, such, however, very seldom occur; rest on the couch for 48 hours in a partially darkened room, and confinement for a week, being as a rule, all the after-treatment required.—*Ophthalmic Hospital Reports, April*, 1869, *p.* 197.

76.—TREATMENT OF CATARACT BY PHOSPHORUS.

M. Tavignot, a well-known and much esteemed Parisian oculist, has lately published in the France Médicale, a series of cases which would go far to prove that frictions on the forehead with phosphorated oil, and instillations of the same into the eye, may contribute to the melting away of the hardened lens or capsule, and the restoration of sight, without the usual operation. These cases are worthy of attention, and should be read by all those who take an interest in ophthalmology.—*Lancet, Jan.* 23, 1869, *p.* 126.

77.—TWO CASES OF ORBITAL TUMOUR, TREATED BY FIRST EXTIRPATING THE DISEASE, AND THEN APPLYING THE CHLORIDE-OF-ZINC PASTE.

Under the care of George Lawson, Esq., at the Middlesex Hospital.

The results of operations for the removal of orbital tumours, and especially of those which are of the malignant class, are generally so unfavourable, that it is pleasing to be able to record instances in which the disease has been eradicated, and the patient has continued for a long time free from any recurrence. In a visit to this hospital a few days since, we had the opportunity of seeing two patients who had been operated on by Mr. Lawson for orbital tumours, both of which were apparently of a cancerous nature. The first patient was a female in the cancer wards, who was admitted into the hospital as far back as January 30th, 1866. She was then suffering from a scirrhous tumour of the left orbit, and from a small growth of a similar nature on the cheek of the same side of the face. From both localities the disease was excised, and, all hemorrhage having been arrested by the application of the actual cautery, the chloride-of-zinc paste, spread on small pieces of lint, was laid evenly over the whole of both surfaces. In due time the sloughs separated, and the wound on the cheek soon cicatrised; but in the orbit the whole of the bony walls perished from the action of the caustics, and were detached in one piece. The skin now contracted closely round the gap, and the patient soon became convalescent. As it was impossible to say that the disease would not recur, the woman was allowed to remain in the hospital, where she has continued up to the present time, and without any recurrence of the tumours. As it is now nearly three years since the operation, the committee have rightly considered that the patient is no longer a fit subject for the cancer charity, and she has therefore received orders to leave the hospital in a short time.

The second patient was only admitted into the hospital on December 1st. The account which he gave of himself was that the right eye was removed last June, on account of an intraocular growth, but that very shortly afterwards a tumour began to grow from within the orbit. On his admission, the lids were tightly stretched over a firm, nodulated tumour, which occupied the orbit, and bulged considerably beyond it. Mr. Lawson treated this case in a

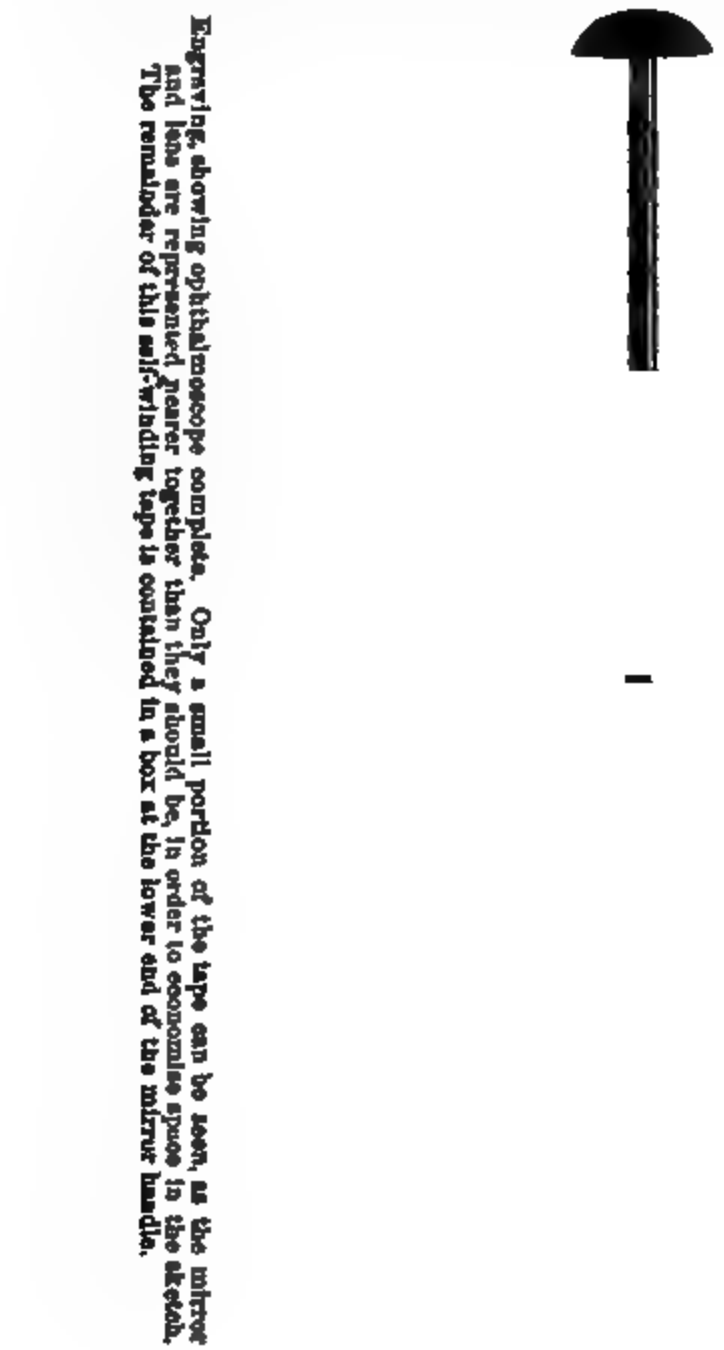
manner similar to the last one. The pain following the operation was very severe; but it was relieved, and sleep obtained, by subcutaneous injections of one-third of a grain of morphia, repeated as often as his sufferings rendered it necessary.

On the fourteenth day after the operation, we saw the sloughs produced by the chloride of zinc lifted away with a pair of forceps from the orbit. As they were removed, they left the bones which they had covered perfectly bare and blanched. No doubt in this as in the first case there will be considerable exfoliation of bone. If any suspicious-looking granulations should spring up, they will be touched freely with the solid chloride of zinc, or with potassa cum calce.—*Lancet, Jan.* 2, 1869, *p.* 10.

78.—IMPROVED OPHTHALMOSCOPE.

By Henry Galsworthy, Esq., Plymouth.

This instrument (manufactured by Weiss) is designed to furnish the practitioner with means whereby the eye can be examined with nearly the same steadiness and precision as with the large and expensive apparatus of Liebreich, and with nearly the same amount of freedom as attends the use of the



Engraving, showing ophthalmoscope complete. Only a small portion of the tape can be seen, as the mirror and lens are represented nearer together than they should be, in order to economise space in the sketch. The remainder of this self-winding tape is contained in a box at the lower end of the mirror handle.

ordinary hand-mirror and lens. It is simple in construction, and consists of two parts—a double convex lens, mounted on a stem, which slides on a graduated brass bar, five inches long, at one end of which is a knob which rests against the patient's face, the other end terminating in a hook; the second portion comprises a perforated mirror, supported on a handle, from the centre of which runs a spring measuring-tape. These two parts are united by connecting the end of the tape with the hook before mentioned.

To use the instrument for indirect examination of the eye, place the thumb of one hand in a ring, fixed underneath the hook at the near extremity of the graduated bar, and the middle finger in a ring attached to the under surface of the slide, and the forefinger on its upper surface; then lay hold of the mirror-handle with the other hand, in such a manner that the tape may pass between the fore and middle fingers in front, the thumb being placed behind; the patient being seated, in the usual manner, by the side of a lamp, the knob at the extreme end of the brass bar should now be placed against his face, and in such a position that the mounted lens shall be in a line between the spectator's eye and that about to be examined. By withdrawing the mirror-hand from the other, the tape can be drawn out to the required extent (about 18 inches) and be fixed by merely pressing the forefinger on it. The lens focus (from one to three inches) will be obtained by moving the slide to and fro on the graduated bar. By gently pressing the bar towards the patient's face with the thumb of the lens-hand, and by keeping the tape slightly on the stretch with the mirror-hand, the whole instrument will have the steadiness of a solid construction. As a further aid, the surgeon may sit the reverse way on a chair, and make its back serve as a rest for his elbow. Should the back be too high, a thick book or other substance should first be placed on the seat of the chair.

For the direct method of examining the eye, the presence of the tape will not prevent the mirror being used in the ordinary manner.

A small black card-board screen, to be hung at the side of the patient's head, is supplied with the instrument. This will sometimes be found useful in private practice, where a screened lamp is not at hand.—*British Medical Journal, Nov.* 28, 1868, *p.* 573.

79.—AN IMPROVEMENT UPON POLITZER'S METHOD OF INJECTING AIR INTO THE EUSTACHIAN TUBES IN CERTAIN CASES OF DEAFNESS.

By Dr. John Brunton, A. M.

Politzer's method of injecting air into the Eustachian tubes is based upon the fact, that when the *circumflexus* or *tensor palati* muscle is put upon the stretch in the act of swallowing, the mouth of the Eustachian tube is opened, and air is allowed to enter the tube.

Politzer directs the patient to take a mouthful of water; the operator then inserts a canula into the right or left nostril, as the case may be; attached to this canula is an India-rubber bag filled with air; on the patient making a sign that he is about to swallow, the operator, closing the nostrils of the patient upon the canula with one hand, so as to prevent all egress of air, as the patient swallows, squeezes the bag, thereby injecting a strong current of air, which immediately rushes up the mouth of the Eustachian tube, which has been opened by the action of the *circumflexus* or *tensor palati* muscle in the act of swallowing.

This method is very useful in many cases, especially those of a catarrhal nature, often restoring the loss of hearing in a manner that seems marvellous to the patient. Nevertheless, advantageous as the operation may be, it has often unpleasant disadvantages. Sometimes, as has occurred to myself, the movement of the patient (the act of swallowing) and the movement of the operator (the act of pressing the bag) are not exactly in unison; and the consequence is, that unpleasant fits of coughing follow by too early pres-

sure of the air, or no injection of air takes place by a too late pressure, necessitating a repetition of the process, which may or may not be very acceptable to the patient.

On account of this, the improvement which is described below suggested itself to me, in consistence with those movements of harmony which abound in the human system. My improvement, as shown by the accompanying woodcut, consists in allowing the patient to be himself both the subject and the operator.

The apparatus consists of an India-rubber bag (10 oz), to which is attached a sufficiently long flexible tube, so that the bag may rest on the floor. To the other end is fixed a gum elastic canula, which the patient passes into his nostril. He then takes a mouthful of water, and as he swallows, holding his nostrils tight with the fingers, presses the bag with his foot, and thereby injects the requisite air.

I have used this apparatus a good many times, have found it invariably satisfactory, and free from the unpleasant results above-mentioned. The movements are in unison.

The accompanying woodcut represents the patient in the act of applying the instrument. Any instrument maker can supply the apparatus, the cost of which is trifling.

It has been stated that a late distinguished aural surgeon sacrificed his much-valued life, while investigating the means to allay ringing noises in the ears, by the injection of medicated vapours, such as the vapour of chloroform, ether, hydrocyanic acid, and the like. If he had used such an apparatus as this, perhaps he might have been still spared to us. I have on several occasions injected the vapour of sulphuric ether and chloroform with ease and without discomfort, to the advantage of the patient. It is only necessary to separate the bag from the tube and pour a few drops of the ether into the bag; the ether immediately becomes volatilized; adjust the tube, and then proceed as with common air.—*Glasgow Med. Journal, Nov.* 1868, *p.* 38

DISEASES OF THE SKIN.

80.—HOW TO USE THE NITRATE OF SILVER IN ERYSIPELATOUS INFLAMMATION.

By JOHN HIGGINBOTTOM, Esq., F. R. S., Hon. Fellow of the Royal College of Surgeons of England.

[Mr. Higginbottom complains that his mode of using nitrate of silver has been carelessly and incorrectly reported in all the medical and surgical works which have professedly copied the plan from his published work.]

The method of applying the nitrate of silver is as follows:—

The affected part should be well washed with soap and water, then with water alone, to remove every particle of soap, as the soap would decompose the nitrate of silver; then to be wiped dry with a soft towel. *The concentrated solution of four scruples of the nitrate of silver to four drachms of distilled water is then to be applied two or three times on the inflamed surface and beyond it, on the healthy skin, to the extent of two or three inches.* The solution may be applied with a small piece of clean linen, attached to the end of a short stick; the linen to be renewed at every subsequent application. As the solution of nitrate of silver is colourless, it is necessary to pass a little linen, just moistened, over every part where it has been used, in order to be equally diffused, so that no part be left untouched.

In about twelve hours it will be seen whether the solution has been well applied. If any inflamed parts be unaffected the solution must be immediately reapplied. Sometimes, even after the most decided application of the nitrate of silver, the inflammation may spread; but is then generally much less severe, and is eventually checked by repeated application. It is desirable to visit the patient every twelve hours, until the inflammation is subdued.

By these means we have complete control over the disease.

For the successful application of the nitrate of silver the ordinary brittle stick, either solid or in solution must be used. Not the "lunar caustic points perfectly tough," nor the crystals and cake used for photographic purposes.—*Practitioner, Jan.* 1869, *p.* 34.

81.—ON THE USE OF SULPHUR IN ITCH.

By Dr. TILBURY FOX, Physician to the Skin Department, Charing-Cross Hospital.

[The writer says that not a week passes but he sees cases in which sulphur has been much misused, producing evil instead of good.]

Sulphur is a remedy which can do a great deal of good and a great deal of harm. That I may prevent some of the latter, I again call attention to one or two therapeutical points of practical importance touching the cure of itch, which by reason of its very commonness is apt to have a stereotyped treatment. Now scabies is usually treated as though all the eruptive phenomena seen in the body of a scabius subject were really "scabies;" that is, as though there were some parasite to destroy wherever a rash exists, and acari were present in or immediately about the papules and vesicles of which the eruption in different parts of the body is composed. The fact is, that in the early stage of itch the acari are almost entirely confined, if not absolutely, to the hands in adults, and to the region of the buttocks and feet in children. In chronic scabies, or in disease derived from contact with a person affected with chronic scabies, acari are no doubt present elsewhere, and in parts other than the hands. But in the general run of cases the essential seat of scabies is the interdigits and the wrist. The mass of the eruption about the arms and the body is secondary to the irritation induced by the acari about the hands, and if the acari there be destroyed, the "sympathetic" eruption, if not artificially aggravated, vanishes. Sulphur is the best remedy for the de-

struction of the itch insect; therefore it should be used (I speak of the majority of cases) to the hands where the acari are: and as it is an irritant to inflamed parts, it should not be hazardously applied to the parts where the secondary eruption exists, for it can serve no other purpose than that of increasing the eruption; and even applied to the apparently sound through irritable skin of a scabious patient, it will induce eruption. Then much of the eruption is the result of scratching the skin to relieve the irritation, its character depending upon the state of health of the patient.

Well, these are very simple truths. But they really require to be repeated over and over again, because the practice of many is to apply sulphur ointment, in a patient affected with itch, to every part that itches; or, indeed, as in the case where the sulphur bath is used, to the whole body. This is a mode of treatment from which I entirely dissent. The specific remedy should be used to the hands as freely as possible, and there only in the vast majority of cases. There is another point of importance. As sulphur is a stimulant, and if freely used an irritant, of course it is desirable to employ it in the least possible amount, but of course such as suffices to effectually kill the acari. I am sure the ordinary sulphur ointment is much too strong. Usually it contains one part in five. I think one in sixteen (half a drachm to the ounce) is sufficient if combined with the ingredients to be presently noticed. The use of the old sulphur and hellebore ointment should be utterly rejected. Before using sulphur it is well to wash the hands with soap. Then another important consideration is the length of time during which it should be used. Very many practitioners continue the sulphur treatment long after this is at all necessary. They are misled by the continuance of the itching, which they take to mean the continuance of the disease, whereas it is sometimes the result of the action of the sulphur. If the acari are killed the itching ceases, of course, and if we carefully note the patient's condition, we shall find that after a few vigorous applications to the interdigits and the wrist only, the itching is subsiding, and the general irritation would then soon cease; but if sulphur has been and continues to be, applied to the sympathetic or secondary eruption, the itching is often only increased and though the true scabies itself (that constituted by the acari in their burrows) is in reality well, the disease is apparently worse, because the secondary eruption has been intensified. Leave off, as I have done in scores of cases that have fallen into my hands, under such circumstances, all sulphur treatment, give a bran bath, and use freely an oxide-of-zinc lotion, and the patient soon gets well. But I have said that there are a few acari scattered about in the midst of the secondary eruption over the body in some cases, especially chronic ones. To kill these it is only necessary to smear over the dark-looking papules about the body, and any eruption along the upper line of the penis, the specific remedy, taking care not to irritate any parts that are "weeping" or "oozing."

These observations relative to the unnecessary irritation of secondary eruptions, apply with special force to the case of children.

I may sum up, then, by saying that in treating scabies we should use the specific remedy in recent cases as freely as we like to the interdigits and wrists *only*, and apply *soothing remedies to the general surface;* that the sulphur should be in small quantity, and that sulphur baths should be discarded. I employ half a drachm to an ounce of lard, with three drops of creasote, and five grains of ammonio-chloride of mercury, a little olive oil, and a drop or two of essential oil. In chronic itch, however, this form of specific remedy may be applied to all eruptions of discrete character. I prefer the three days' treatment of scabies, keeping on the same linen, and then having a thorough cleansing with soap and a clean change. Less after-consequences follow this than more heroic and rapid modes of cure.

I may just say in regard to skin diseases, generally, that sulphur is only admissible in chronic cases where there is an absence of active inflammatory action. We find it said in books that it is good for eczema, psoriasis, acne, erythema, and other diseases. Well, not in the acute or active stage. It does harm. When diseases have become indolent, and the skin needs to be

stimulated, then sulphur is of use, and I think then only. I have seen on many faces and many skins a dirty, rough, and slightly reddened surface, difficult of cure, produced by the use of sulphur, very much to the annoyance of patients. Stimulation is constantly effected where soothing is required. The matter is a simple one, as I have said, but important for all that to practitioners.—*Lancet, March* 6, 1869, *p.* 322.

82.—A FEW CURIOUS FACTS RESPECTING HERPES ZOSTER.

By Jonathan Hutchinson, Esq.

Herpes zoster is a disease which offers to the clinical observer some very interesting and important problems. Its non-symmetry and non-contagiousness, its observance of stages and spontaneous disappearance, and its occurrence but once in the patient's life, are well established as general facts, though none of them without occasional exceptions. The first two seem to connect it with the neuroses, the others to ally it to the exanthems. Such being the puzzling position which it occupies, I think the following facts and remarks worthy of publication.

I regard it as certain that special conditions of the blood may so irritate the roots of the sensory nerve trunks as to induce those trunks to cause at the periphery herpetic inflammation. Thus we have a syphilitic herpes zoster, in which the patches are located exactly as are those of common herpes zoster, and clearly under the influence of nerve distribution. But these cases differ from the common herpes zoster in that the eruption is usually on both sides of the trunk and on other parts of the body. It may also last much longer than common herpes zoster does. These circumstances, symmetry of eruption and long persistence, are what we should expect in connexion with the blood cause. Some facts which have recently come under my notice incline me to believe that herpes zoster, in its most typical form, and following its usual course, may be produced by a blood cause. *A priori*, we should have thought it most improbable that a non-symmetrical eruption could occur in connexion with such a cause. The facts to which I refer are a group of cases in which herpes zoster has occurred in patients who were at the time taking arsenic. They have been so numerous that I think their occurrence must be something more than a coincidence. Should further experience confirm my present suspicion, we shall have gained a step in our knowledge of the pathology of herpes zoster, and shall, perhaps, have also furnished another fact to those modern neurologists who hold that the nervous system is less symmetrical in function than has hitherto been supposed.

Case 1.—*Partially Symmetrical Herpes Zoster occurring in a Patient who was taking Arsenic.*—The following notes were taken about three years ago, and describe the condition of a patient who was kindly sent to me by Dr. Hughlings-Jackson. It was of special interest both as an example of symmetrical herpes, and because it came on during an arsenic course. I have described its positions in more detail than would otherwise have been requisite because of its occurrence on both sides.

"A robust man, aged 67, is attending at the London Hospital, under Dr. Hughlings-Jackson, for sciatica, and has been taking five-minim doses of liquor arsenicalis. He is now the subject of herpes zoster, which began a few days ago. He says he had very trifling pain when the rash began to come out. It first appeared behind his right ear. It now covers the right side of his neck, his right shoulder as low down as the spine of the scapula and the right side of the front of his chest as low as the upper border of the third rib. On the front of the right arm it extends as low as about two inches below the axilla. The vesicles are quite characteristically those of herpes zoster, with some tendency to ulcerate in parts. Looking at the front of his chest, the inflammation of his skin stops abruptly at the middle line, but at a distance from this, on the left side, there are a few isolated small patches of vesicles over precisely the same area as is affected on the other side. There

are a few isolated vesicles on the left side of the neck, but they are only to be seen when looked for very carefully. There are none on the left side of his cheek nor behind the left ear; none on the left front of his neck. Thus the disease is fairly symmetrical as to the areas affected, but occurs very much more severely and copiously on one side than the other. The amount of irritation has been much less than usual."

Case 2.—Arsenic administered in a Case of Eczema—Herpes Zoster on the Trunk a fortnight later.—A man, aged 32, was admitted at the Hospital for Skin Diseases, in January, 1866, for eczema, &c. Three-minim doses of Fowler's solution were ordered. A fortnight later he had a free eruption of shingles on the right side of the chest. The arsenic was continued. The shingles went through the usual course, and soon disappeared. On November 30 he again attended for a relapse of the original eruption. On examination it was found that the shingles had not left any perceptible scars. It had been a mild attack.

Case 3.—Herpes Zoster on Lower Part of Abdomen one Week after beginning an Arsenical Course.—A man, aged 66, was admitted on September 7, 1866, with eczema rubrum of the legs, and amongst other treatment arsenic internally was ordered. On September 18 there was a free eruption of herpes zoster on the right side, in the iliac region, and side of abdomen. He had taken the medicine about a week before the herpes showed itself.

Case 4.—Herpes Zoster Six Weeks after beginning an Arsenical Course.—A woman, aged 48, who attended in December, 1866, had been taking arsenic six weeks for eczema. At the end of that time herpes zoster showed itself on the right side of the chest, and went through its usual course.

Case 5.—Herpes Zoster Frontalis Three Months after commencing the Use of Arsenic.—A woman, aged 44, admitted on April 9, 1867, on account of psoriasis, had six minims of Fowler's solution ordered three times a day. On June 14 the dose was reduced to three minims. On July 12, her psoriasis being now nearly cured, she was attacked by herpes zoster frontalis in the right side. The herpes was of no great severity, and it disappeared as usual although the arsenic was continued.

Case 6.—Herpes Zoster of the Buttock after Three Months' Use of Arsenic.—A boy, aged 8, the subject of complicated and chronic skin diseases (lichen, &c.), took small doses of arsenic from November to March, when he had herpes zoster on the left buttock.

Case 7.—Herpes Zoster during the Use of Arsenic.—A girl, aged 14, admitted on January 1, 1867, with psoriasis of the scalp, took arsenic from that date to the 29th, when she had herpes zoster on the right side of trunk.

Case 8.—An Eruption resembling Herpes in Arrangement, but not Vesicular, during treatment by Arsenic.—A man, aged 50, who was taking arsenic, had a curious unsymmetrical eruption arranged just like shingles, but which remained papular, and never showed vesicles. It disappeared, as usual with shingles, after about ten days' duration.—*Medical Times and Gazette, Dec.* 26, 1868, *p.* 722.

83.—ON THE TREATMENT OF CARBUNCLE.

By James Paget, Esq., F. R. S., Surgeon to St. Bartholomew's Hospital.

Although you may not have seen much of it, you must all have heard of the ordinary manner in which carbuncles were treated formerly, and still are by some; a method which consists mainly in making large incisions through them, and giving very large quantities of food and stimulants, as well as considerable doses of quinine, bark, and other tonics. I do not at all mean to say that the things which in these cases I left undone would have done any harm; but what I hold of them is, that they would have been quite useless, and some would have been sources of great discomfort to the patients. And in the way in which I speak of these things you may notice that I exemplify that rule which I have always impressed upon you, of asking yourselves, when

you seem to have been successful with some medicine, "What would have happened if I had not given it?" The apparent consequence of giving a medicine may be plain enough; but you cannot too often repeat to yourselves the question—as a rule, I will not say of practice, but of the study of your own practice,—"What would have happened if this or that, which seems to have been successful, had not been done?"

First, with regard to the incisions made in carbuncles. The ordinary plan, still recommended by some, is, as soon as a carbuncle is seen, to make two incisions crucially from border to border. It is said that they must go even beyond the edges of the carbuncle into the adjacent healthy textures. I have not followed that method of practice very often, but I have followed it quite often enough to be sure that it does not produce the effects which are commonly assigned to it. It is commonly said that if you will thus make crucial incisions into a carbuncle, you will prevent it spreading. If you can find a carbuncle two or three days old, and cut that right across in both directions, I think it very likely that you will prevent it spreading. But even therein is a fallacy; for there is no sign by which, on looking at a commencing carbuncle, you can tell whether it will spread or not, whether it will have a diameter of an inch, or of three, six, or ten inches. The question, therefore, that I spoke of comes back, "What would have happened if I had not made these incisions?" And the answer to that question will be rather according to temper than according to knowledge. For as I watch men in their conclusions upon such cases as that, I generally find that self-satisfaction says, "I saved the man's life;" self-dissatisfaction, "I did him no good." The truer scientific temper stands midway, and says, "I will wait for further information on the matter—till I have seen more cases, and then decide whether, in the earliest stages of carbuncle, incisions are useful or not." After this time of three or four days I have seen sufficient numbers of carbuncles thus divided, and have divided enough for myself, to say that it will not hinder the spreading. I have seen carbuncles spread in as large a proportion of cases after incision as in cases that have never been incised at all. I have in my mind a striking case that occurred to me early in practice, when I followed the routine, and, in a friend of my own, divided a carbuncle most freely. I cut it after the most approved fashion in depth and length and width, and then it spread. After two or three days more all the newly-formed part was cut as freely as the first, and then it spread again, and again it was cut as freely. Then it spread again and was not cut. Then, in a natural time, it ceased to spread, and all went on well. These are only general impressions that I give you, because one cannot count the cases in which cutting has been practised, and those similar cases in which it has not; nor even then could it be said whether those in which the cutting was practised would have spread if left alone. On a very strong general impression, however, I say that carbuncles will spread after cutting in as large a proportion of cases as they will spread in without cutting.

Then it is said that carbuncles are relieved of their pain if they are thus very freely cut. Here, again, however, is only a partial truth. A carbuncle of two or three days' standing, which is hard, tense, and brawny, is very painful; and cutting it will relieve, in many cases, a considerable portion of the pain. But after this, when the carbuncle begins to soften, and when pustules begin to form upon its surface, and pus in its interior, it ceases to be painful of its own accord, and without incisions. Thus there are two distinct stages of carbuncle in reference to the pain; the early stage, when it is hard and still spreading, and is generally intensely painful, and the latter stage, in which that pain nearly ceases. A carbuncle divided in the first stage, in the first two or three days of its existence, may be relieved of some of its pain; if divided in the later stage, what little pain may exist is altogether unaffected by the cutting. And even cut as you may, you cannot always put aside the extreme pain that a carbuncle sometimes has, even to its later time. Some two or three years ago, I was called to a member of our profession with a large carbuncle in the middle of his back. His friends had been much alarmed about the state of his mind, for he had been suffering great mental

anxiety for some time, and they were in fear lest the excessive pain of the carbuncle should, in his disturbed state, do his mind permanent damage. So they persuaded me to cut it, and I cut it after the old plan, very wide across, and far into the adjacent textures, as freely as could be. It did not in the least relieve him. I never saw a carbuncle through its whole course so painful as that was, and up to the last, till the healing was nearly completed, he suffered more or less pain in it. So that the conclusion in reference to the pain must be this: if they can be divided in the first three or four days, while still hard and brawny, it may relieve some measure of the suffering; at a later period the incisions have no influence at all.

The third point is stated thus, that by the incision of carbuncles you accelerate their healing, giving facility for the exit of sloughs. But herein is the greatest fallacy of all. When the cutting of carbuncles was more customary in this hospital than it is now, when I did not cut them, and some of my colleagues did, I used to be able to compare the progress of cases cut and of cases uncut, and time after time it was evident that the cases uncut healed more readily than those cut. A man who is now in the hospital I have brought round here that I may illustrate this point to you. This is the man, Timothy C., aged fifty-five. When he came in, this carbuncle had a length of more than six inches, and a breadth of three and a half; and it formed the ordinary hard, compact, tense, and brawny mass that a carbuncle usually does. It had at that time already taken to suppurate, and little pustules were pointing on the surface. If I had followed the practice of incisions, I should have had to make a cut in one direction of about seven inches, and in the other of about five, and after that I should have had not only the wounds wide, open, and gaping, and having themselves to heal, but a great part of the substance of the carbuncle fairly exposed, and also under the necessity of healing. But you will observe that the whole of the space that now remains to heal is a series of openings in the middle of the carbuncle, through which the sloughs are to be separated, through which, indeed, nearly the whole of the sloughs have already been discharged, and which now merely remain to be healed like the cavities of small abscesses. In that way you narrow greatly the extent of wounded surface to be healed. Indeed, it by no means always follows that the whole carbuncle, or its whole base, sloughs. Carbuncles, if not divided, not unfrequently only suppurate about their centres, and slough only in their central parts, and the borders merely clear up by the softening and dispersion of the inflammatory products in them. In every case of that kind you save greatly the amount of healing which has to be gone through. Nay, in some cases carbuncles completely abort. One of these cases, of which I have the paper on the table, was that of a woman, aged 64, who came in with a carbuncle nearly as large as this, in a condition which, it might be said, required incision at once; but, with the exception of two or three small points, no suppuration or sloughing ensued. That carbuncle dispersed, aborted, cleared away. This case shows the more ordinary course of events—the sloughing of the central part, the gradual discharge of the sloughs, and the comparatively small spaces which are left in the centre of the carbuncle as the sole space in which the process of healing has to be achieved,

On these three points, which are the grounds that have been assigned as reasons for cutting carbuncles, I have now given you the evidence on which I have ceased from the practice. I fully believe that crucial incisions do not prevent extension; that it is only a limited set of cases in which the incisions diminish pain; and that with regard to the time that is occupied in healing with or without incisions, the healing without incisions is very clearly and certainly a great deal the quicker.

The kind of incisions that I have been speaking of is the old plan of crucial incisions. Another method which I have occasionally tried, but of which I can only state the same general results, is that of subcutaneous incision. This has been supposed to have the same general effect as the other; and I think that the same general conclusions may be drawn respecting it: that it is a measure unnecessary in the treatment of carbuncle, and

that it retards rather than hastens the healing. When I speak thus of the incision of carbuncles, however, I do not mean to say that there is no condition of carbuncles in which an incision is not useful. Sometimes a carbuncle sloughs in its central part, with one continuous slough of integument holding in a quantity of pus. In that case you would cut through the slough, or through any adjacent part of the carbuncle, to let out the pus, as you would open an ordinary abscess. But this is not a measure which is commonly understood by the "incision of a carbuncle."

If you ask why one may not cut a carbuncle though it may do no good, I reply that you should never be actively useless, and that there are some cases in which the cutting does considerable harm. Carbuncles, for the most part, occur in persons broken down in health, exhausted by over-work, or by bad food, or in general deteriorated health—as sometimes in diabetes or albuminuria; and in all these states it is a good general rule to save the blood they need for healing. The loss of blood from the carbuncle itself would not be considerable; the hard substance of the carbuncle, when cut into, does not bleed, or bleeds but little. But to carry out the incision perfectly, you have to cut into the adjacent healthy texture; and this sometimes bleeds very profusely, so as to lead to all the distress and pain of plugging the wound with this or that substance to arrest the blood.

Another measure in the treatment of carbuncles which is supposed to be necessary, is very high feeding and large quantities of stimulants. I learned the opposite of this in one of those cases which you will do always well to study—those, namely, in which the patient refuses to do what you advise him. It is from such cases that we may often learn what is commonly called the "natural history of disease"—its course undisturbed by treatment. A case occurred to me once of an old gentleman, eighty years of age, who had a carbuncle, as big as it could be, on the back of his neck, for it extended from one ear to the other, and from his occipital spine to the third cervical vertebra. He measured it for his own amusement, and it was fourteen inches over its surface transversely, and nine inches vertically—a carbuncle, then, of the largest size, and one it might have been supposed, attended with considerable risk to life. I urged him very strongly to take a large quantity of what is called "support," for I was at that time under an impression of its necessity. He absolutely refused however, and nothing would induce him to take it. I was therefore content to stand by and study the natural history of disease in this huge carbuncle; and the natural history of it was a history that one would have wished to witness in every carbuncle of its size, for no case could pass through its course in a better method. He led his ordinary abstemious life, took moderate quantities of food and stimulant, lived through a carbuncle of the greatest severity, and finally made a complete recovery, and lived for several years after.

Another case which impressed me very much was that of a friend of my own in the profession, who had a carbuncle on the back of his neck, of very considerable size. Sir Benjamin Brodie and Mr. Stanley attended him with me, and under their advice the carbuncle was cut. I watched its course afterwards, and felt sure that the cutting had done neither good nor harm. It went on as carbuncles do when not cut. But the gentleman was subject to intense headaches, of which he knew by experience the only possible remedy was almost entirely to leave off food, and absolutely and entirely to leave off stimulants. One of these headaches occurred during the course of the carbuncle, at a time when we had put him on full diet and abundant stimulant. He said then that he must leave off his stimulants and food, and we looked with some alarm at what would be the result on the progress of the carbuncle. I remember Mr. Stanley saying to him, in his distinct manner, "My dear fellow, if you don't take food, you will die." "Very well," he said, "then I will die, but I will not take food and increase my headache." According to his own wish, therefore, we reduced his diet to a very low level. The course of the carbuncle was not affected at all, unless it were for good; and after three or four days of this, which might be called comparative starvation, he described himself in his own emphatic fashion as being "as jolly as a sand-boy."

Since that time I have watched carefully all cases that I have seen, and I am certain that there is no good to be obtained by large feeding or abundant stimulants in ordinary cases of carbuncle. The whole of these cases that have been in the hospital were put on our ordinary meat diet, with a pint of porter daily; and I see that two of them have had four ounces of wine a day, one of these being a person aged 64 and the other 63, and both having carbuncles of considerable size. You will find that for patients in private life it will do very well if you tell them that they may have about two-thirds of their ordinary amount of food, and about the same proportion of their ordinary quantity of stimulants. But indeed there is scarcely any reason to change in any material degree the ordinary mode of life of a patient with carbuncle. So far as he can with comfort take that to which he is accustomed, so far he may. If his diet has been habitually low, so it may remain; if habitually high, so, within certain limits and somewhat reduced it may still remain.

Now you may ask what I should set down as the things to be done for a carbuncle. These boards, nearly bare as they are, may tell you. In local treatment one of the best things you can do, if the carbuncle is small, is to cover it with emplastrum plumbi spread upon leather, with a hole in the middle through which the pus can exude and the slough can come away. That, occasionally changed, is all the covering a small carbuncle will need. It is difficult thus to cover the whole surface of a large carbuncle, and to keep it clean; therefore, I think that the best application for that is the common resin cerate. This should be spread large enough to cover the whole carbuncle, and over it should be laid a poultice of half linseed-meal and half bread. And, if you want to exercise your skill, learn to make that poultice well, and to put it on well, and to keep it in its place well. That mode of dressing the carbuncle, so far as the materials are concerned, will last through its whole course: but whilst the carbuncle is making progress and discharging its slough, you will find plenty of room for the exercise of considerable skill in dressing it, and filling up the cavities with soft substance spread with this ointment. Besides this, the carbuncles are to be carefully washed, and especially with some deodorising substance, as Condy's fluid, or weak carbolic acid, and the cavities may be syringed out with it. The importance of cleanliness is very great. You noticed in the man I showed you just now the spots of acne and boils round the edges of the carbuncle. This points out the necessity of care, which I suppose had not been taken there, to keep the surface of the skin adjacent to the carbuncle perfectly dry, and free from any contact with the discharge, which seems really to have the power of infecting the neighbouring skin, and so producing the boils which are apt to arise, sometimes in clusters, around the carbuncle. Of diet I have already spoken to you. Of medicines I say nothing. Quinine, bark, and other medicines of that class, may be given if you please, or in case of evident need, and so many aperients; but there is really no need of them in an ordinary case of carbuncle. But there is one medicine which you may find very valuable, and that is opium, especially in all the earlier painful stages of carbuncle, in which it relieves the suffering as thoroughly as incisions, or any thing I know. After the early stages, even that is unnecessary, except for some patient who may be unable to sleep.

But there is one measure in the treatment of carbuncle which is seldom employed, and yet is of great importance, and that is letting the patient have very free air. The general idea that carbuncles are very dangerous diseases has commonly led to the patients being entirely confined to bed and kept shut up in their rooms. There is in that an unnecessary care; and this, too, I learned from a patient who refused to comply with injunctions—a gentleman with a large carbuncle on the back of his head, who would not keep his bedroom. He had been accustomed to an active life, and after seventy or eighty years of that custom he was quite indisposed to remain in his room. So with that carbuncle he daily came down stairs, changing his room and moving about the house as well as the pain and weakness would allow him. No carbuncle could go on better; all the stages were passed through without

any risk or trouble, it healed with unusual speed. After that I had a yet more striking case. A lady came to London "for the season," as she called it; and she had not been here more than a week or ten days before a carbuncle came out on the back of her head, just under her hair. It was a great vexation to her that she had to give up all her amusements; and so, as she did not mind the pain, she would go out. And it was then that, for the first time and last, I saw any value in a "chignon." She dressed the carbuncle under the chignon, and she went to the park, to the theatre, and to dances unharmed, and with her carbuncle quite unseen, and no trouble whatever followed. It healed up after the ordinary fashion and in about the ordinary time. But, indeed, you may see cases of this description on a much larger scale if you watch the carbuncles that come to us in the out-patients' room. There we often see them of considerable size, and they do as well among the out-patients as among the in-patients; and yet these out-patients are freely in the air all day, and many of them continue at their work. So you may set it down as one point to be attended to in the management of carbuncles that patients should not be confined to their room. They should at least have change of air in their own house; and, unless they are too low, they should not avoid exposure to the fresh open air.

Treating your cases of carbuncle upon this plan, I believe you will find that the great majority will pass through their course well.—*Lancet, Jan.* 16, 1869, *p.* 73.

SYPHILITIC DISEASES.

84.—OBSTINATE CASES OF ACUTE AND CHRONIC GONORRHŒA, SUCCESSFULLY TREATED BY INJECTIONS OF GLYCERINE OF TANNIN.

From cases under the care of J. D. Hill, Esq., at the Royal Free Hospital, London.

Perhaps no surgical disease is so frequently observed in hospital (out-patient) practice as gonorrhœa, and the treatment which is advocated by surgical authorities cannot in many instances be surpassed; occasionally, however, troublesome cases will arise, both in the acute and chronic form of the disorder.

In these cases, previous to the employment of any kind of local or constitutional treatment, whether alone or in combination, several circumstances, Mr. Hill thinks, have to be considered.

First, it is necessary to determine the occupation, habits, and constitutional peculiarities of the patient; or, in other words, what assistance, both from within and without, can be brought to bear upon a purely local affection. Secondly, to overcome local difficulties, which are both physiological and mechanical in character; and these may be briefly said to consist in the mobility of the affected part, its dependent position, and the occasional contact of an irritating fluid—the urine.

The treatment which Mr. Hill tells us he has extensively employed in hospital and private practice was, he believes, first introduced by Dr. Ringer, of University College, who has kindly favoured him with the following remarks:—"For some time past I have been making observations with an injection of glycerine of tannin in chronic gonorrhœa and gleets, and have found it of great use, especially in gleets, which I believe may be removed more quickly with this injection than perhaps any other. In the acute stage of the disease a little care is necessary, or great pain is caused. This may be prevented by diluting the glycerine of tannin with equal parts of mucilage. Another point to attend to is that the injection should not be injected too far, or it causes a great and frequent desire to make water."

Mr. Hill is therefore enabled to support the experience of Dr. Ringer, not only by recent cases, but also by observations on the treatment of gonorrhœa by tannin and mucilage injections extending over some years. These

injections he first used in the proportion of ten grains to the ounce, but latterly, as suggested by Dr. Ringer, he found the glycerine of tannin more serviceable, slightly modified, however, as to the diluting agent.

The precaution alluded to as to injecting is probably a most important one, whatever be the lotion employed; for although in some few instances the fluid may be injected too far, in the larger number it will not be injected far enough. Now in either case the surgeon is blamed for a fault which in reality rests with the patient; and here it may not be out of place to describe the method which Mr. Hill recommends to all patients using the injections:

"The bladder having been first emptied, the bottle containing the lotion is to be well shaken, and about two drachms of it briskly poured into a saucer. This must be quickly drawn into a glass syringe with a bore in the nozzle equal to a No. 6 catheter. The penis is then to be held in the left hand, with the thumb and little finger respectively placed upon the superior and inferior portions of that organ close to the symphysis pubis, and the fore and middle fingers resting in like manner upon the superior and inferior surfaces of the glans close to the meatus urinarius. The syringe, with the piston withdrawn, is now to be taken up with the right hand, and the nozzle as far as its shoulder carefully passed into the urethra. Previous to injecting, the thumb and little finger of the left hand must compress the root of the penis, in order that the urethra be closed against the passage of any fluid beyond this point. When a sense of tension is felt, the syringe may be withdrawn; but the front fingers must previously be so applied as to compress the glans, and thus prevent any escape of fluid from the meatus. Next, with the thumb and forefinger of the right hand the fluid in the urethra is to be set in motion, and so kept for four or five minutes. This will be attended with a gurgling noise from the mixture of air and fluid. Thus, when the injection has so insinuated itself within the folds and lacunæ of the urethra as to saturate the openings of the follicles and mucous glands, and permeate the whole of the affected structure, it is allowed to escape."

It is conceived that by these means the bladder is protected on the one hand, and on the other there is a certainty of the fluid being applied to the affected surface of the urethra.

Mr. Hill has furnished us with the notes of six cases in which the glycerine of tannin would appear to have been of great service. In several, injections of zinc, lead, and alum had been employed without much benefit. The formula employed was the following:—Glycerine of tannin, three ounces; olive oil and mucilage, of each one ounce.—*Lancet*, *March* 20, 1869, *p.* 398.

MIDWIFERY,

AND THE DISEASES OF WOMEN AND CHILDREN.

85.—ON IMPROVED METHODS OF INDUCING AND ACCELERATING LABOUR.

By Dr. Robert Barnes, Lecturer on Midwifery at St. Thomas' Hospital.

[The results of the modes of inducing premature labour usually followed have not appeared to Dr. Barnes to be very satisfactory. There is for instance no certainty about the time at which labour commences, and when it comes the child is liable to be expelled somewhat suddenly in the absence of the medical man. Moreover, owing to the frequent excess of liquor amnii when the child comes to present, it is liable to assume an unfavourable position, or the cord falls through. Hence it follows that it is desirable to keep control over the whole course of the labour.]

Assuming that it is both desirable and possible to control and to regulate the entire course of labour prematurely induced, I will describe the method after which the proceeding should be conducted. It is convenient to divide the act of artificial labour into two stages. *The first stage is provocative and preparatory*; this includes some amount of dilatation of the cervix uteri, and implies a certain amount of uterine action, and lubrication of the cervix and vagina. *The second stage is the accelerative or concluding stage;* it consists in the expulsion or extraction of the fœtus and placenta.

The ordinary modes of conducting an induced labour almost ignore the last stage, or the means of accelerating delivery.

1. *The provocative,and preparatory stage.*—The means of preparing the uterus for the task prematurely thrown upon it are numerous. I will not discuss their relative merits in detail, as I have done this in a memoir on "The Induction of Premature Labour," in the Obstetrical Transactions, 1862; but I think it important to repeat an emphatic warning against one of them. I mean the plan of injecting water or other fluid into the uterus. This was introduced by Schweighäuser and Cohen; and is sometimes described as Kiwisch's plan. But Kiwisch's plan is simply to inject water into the vagina, playing the stream against the os uteri, not into the cavity of the uterus. Now Kiwisch's plan is generally harmless, but it is certainly often useless. On the other hand, Cohen's intra-uterine injection, although far more certain in its action, is fraught with extreme danger. *Both in this country and abroad several cases of severe shock and of sudden death have been caused by it.* Of course no advantage, or conveni ence, however great, can counterbalance such a danger. The plan, therefore ought to be rigorously discarded. There are means that are perfectly safe and effective.

It is important to recognise, *in limine*, the essential difference between provoked premature labour and labour at term. *In the premature case, labour finds the uterus in an imperfect state of development.* This condition involves imperfection in the contractile power of the body of the uterus, and greater resistance in the cervix. These things must be taken into account. They call for artificial aid. The uterus is called upon suddenly,

and before its time, to do that for which it is not prepared. It is but reasonable to anticipate that help will often be useful. And help can be given to facilitate the dilatation of the cervix, and to supplement the contractile energy, if this cannot be aroused. The course I adopt is as follows: Having determined as closely as possible the period of gestation, I fix the day for the operation. On the evening of that day, the patient being in bed, I pass a No. 8 or 9 elastic bougie into the uterus, as far as it will easily slip in; it will generally go in to the extent of four to six inches. The end projecting beyond the os is then twisted up into the vagina; this keeps the bougie *in situ*. The patient keeps her bed for the night, so as not to disturb the bougie. Next morning, it will almost always be found that some degree of preparatory action has been effected. The cervix will be softer, and perhaps admit the finger; the vagina will be well lubricated with mucus; and some uterine contraction or pains will be present. If this should merge into active labour, the bougie may be withdrawn; otherwise it may be left or replaced. Towards the afternoon, the cervix will be more yielding and expanded. The further course must then be determined by the special indications of the case. If the pelvis be normal, and the labour have been induced on account of constitutional disease, it is generally better not to resort to any active accelerative measures, but to let the labour take its own course. When the cervix will admit of two or three fingers, if active pains are not present, it will, however, be desirable to tap the membranes by making a small scratch with a stilet or a quill. The drawing-off of a little liquor amnii, allowing the uterus to collapse, commonly stimulates it to increased activity, and in a few hours the child may be expelled. It is, of course, necessary to watch, lest the position of the child should become unfavourable, or the cord become prolapsed; circumstances, I repeat, very likely to occur in premature labour.

If the labour have been provoked on account of pelvic distortion, greater assistance will be required. The first difficulty to overcome is the resistance of the cervix uteri. The great agent in dilating this structure is *the direct pressure upon and within it* of the fœtus and membranes distended by liquor amnii. But when the brim is contracted, this pressure can rarely be exerted effectually. Hence the tediousness and the danger attending the *laissez-faire* or expectant treatment. The child may perish from long compression; the mother may be exhausted by protracted pain and shock. To avoid these dangers, it is now necessary to dilate the cervix by means that imitate as nearly as possible the natural agency. Introduce the caoutchouc water-dilator into the cervix, taking care that the narrow middle part of the bag be gripped in the ring of the cervix; then distending it gently and slowly with tepid water, the finger on the cervix takes note of its effect. In half-an-hour or an hour, the middle sized bag will commonly have increased the dilatation so that the cervix will admit three or four fingers. This is the time to rupture the membranes. If the uterus act with sufficient power, and the pelvic contraction be not so great as to impede the passage of the child's head, watch, and let nature do her work. But if the head is delayed at the brim, the physician must intervene. He has two alternatives. He may first try the forceps. If the distortion is moderate, the conjugate diameter measuring say 3·50″, the head may come through. But if it do not come easily, and especially if the conjugate is reduced to 3·00″ or below, turning is the true accelerative means. If I may trust my experience, I should, without hesitation, say the prospect of a child being born alive under the conditions postulated is much better than under any other mode of delivery, and even better than is the prospect under turning in ordinary circumstances at the full period of gestation. The explanation is as follows: the child's head is not only smaller, but it is more easily moulded; it is caught at the smaller or bi-temporal diameter, between the projecting promontory and the symphysis pubis; the jutting promontory leaves abundant room on either side in the sacro-iliac region of the brim for the cord to lie protected from pressure; and if care be taken that the cervix uteri be adequately expanded, the

head comes through so quickly that the danger of asphyxia is not great. The mode of turning demands consideration. The object being to secure a quick delivery, the soft passages must be well prepared. We might turn by the bi-polar method without passing more than two fingers through the os uteri. But I have found that, although it is always well to avail ourselves more or less of the bi-polar principle to facilitate turning, it is desirable in this case to pass the greater part of the hand through the cervix to grasp the further knee. The reason is this: the cervix that will admit the hand will in all probability admit the ready transit of the child. We thus secure adequate dilatation.

When the turning is completed, extraction must follow. It should be performed gently, drawing upon the one leg until the breach has passed the outlet; the extraction of the trunk should be slow, and a loop of cord should be drawn down to take off tension. When the arms are liberated, the neck of the child is in danger of being constringed in the circle of the cervix. This is the moment for acceleration. The two legs are held at the ankles by the left hand, whilst the right hand fingers are crutched over the back of the neck. The head is sure to enter the contracted brim in the transverse diameter; it then has to describe the circle round the point of the jutting promontory which I have described ('Lectures on Obstetric Operations,' Med. Times and Gazette, 1868) as "the curve of the false promontory." Traction must, therefore, at first, be carefully exerted in the direction of this curve or orbit; that is, well backwards, so as to bring the head round and *under* the promontory. When it has cleared the strait and is in the pelvis, the occiput commonly comes forward, and traction is changed to the direction of Carus' curve, to carry the head through the outlet. Unless rigorous attention be paid to the above rule for bringing the head through the brim, so much time may be lost as to imperil the success of the operation.

Turning, as a mode of delivery in contracted pelvis, is not, I believe, yet established as an orthodox proceeding. Certainly to be successful it requires precision in diagnosis and skill in execution. But these are requisite conditions in all surgical operations. I have now, with tolerably mature experience of the operation in all its applications, no hesitation in expressing my opinion that turning in contracted pelvis, where labor is induced prematurely, is an operation of the highest value as a means of extricating the mother from peril, and of saving the child. It has this great advantage: it enables us to postpone the induction of labour for two or three weeks or more, so as to reach the stage of greater development of the child. If, for example, we preclude ourselves from turning, and the pelvic contraction leave only 3·00″ or less of conjugate diameter, we must bring on labour at the end of seven months, or spontaneous delivery may be defeated, and with this the child is lost: whereas, if we contemplate turning, the gestation may be allowed to go on till the end of eight months; for a living child may easily be drawn through a conjugate of 3·00″. A further advantage obtained by this postponement consists in the greater probability of having to deal with a viable child. If we calculate too closely, say from the first week after the last menstruation, and fix the induction of labour 220 days from the time, we may find that the child has really not attained a stage of development corresponding to our calculation. One design of the proceeding is thus frustrated by error of estimation. But, if on the other hand, we feel confidence in putting off the labour until the 250th day, we cover this range of liability to error, and secure a child that is at any rate viable.—*St. George's Hospital Reports*, *Vol.* 3, 1868, *p.* 111.

86.—ON STRICTURE OF THE INTERNAL OS AS A CAUSE OF MISCARRIAGE.

By Dr. William Marshall, Mortlake, Surrey.

Mrs. D., aged 30, a delicate woman, five months advanced in pregnancy, was taken with labour pains about six o'clock one evening. I saw her at

8.30. The pains were strong and forcing, very similar in character to those which immediately precede the expulsion of the head in a primipari. I was told that when pregnant last she had miscarried at the fifth month, and that the pains then, for three hours, had been very severe—much worse than she had ever had them in any confinement, and similar to what they were now. On examination, I found the os uteri dilated to the size of half-a-crown, and very soft. On passing my finger further up in order to feel the fœtus, I found the canal of the cervix becoming decidedly narrower, when suddenly she cried out that I was cutting her, and jerked herself away. On a second attempt the same thing was repeated; but on a third, being prepared for her moving, I ascertained that a tight resisting constriction existed at the internal os, which would not admit the tip of the finger. As soon as I touched the constricted part, she complained of a severe cutting pain; and on attempting to pass the finger through it, she became hysterical, and on my persisting, *perfectly maniacal*. On withdrawing my finger she immediately became rational, and complained of the agonizing pain I had caused her.

As she was quite positive that in her previous miscarriage she had suffered for three hours as much as she was doing now, I waited for a couple of hours. During this time the pains were very strong, and the suffering greater than I had ever seen in any confinement. In order to make a thorough examination, I put her under chloroform. The external os was very soft, and dilated; but at the internal os there existed a constriction which still readily allowed the finger to pass through, and which seemed now quite dilatable. The breech was presenting, and I had no doubt that when a pain came it would be pushed through, and the whole thing soon be at an end. The pains, however, did not return as long as I kept her under chloroform, so that I was forced to discontinue it. The stricture returned with the first pain, firmly grasping the tip of my finger, which I had retained in the uterus. I now gave her a dose of ergot, and waited until one o'clock, when, finding that little or no progress had been made, I determined to notch the stricture in one or two places, under chloroform, as it was impossible to touch it without causing intense pain, and bringing on a maniacal paroxysm. I went home for a probe-pointed bistoury, and on my return in half-an-hour, found the strictured part, with the breech forced into it, protruded through the external os, which was drawn up around it. After a few pains, the breech passed through the constriction: I pulled down the body, and finding that the head would not come, pushed my finger past it, hooked it over the crown, and pulled the head through the stricture. Without drawing my finger, I detached the placenta, and withdrew it and the finger at the same time. While doing all this, the patient was perfectly maniacal—she shrieked, kicked, struck and bit at those around her. Immediately on withdrawing the finger she became rational, and apologised for what she had done; the agony had been so intense, she said, as to drive her for the time out of her senses. She recovered without a bad symptom.

To one interested in uterine pathology, this case is, I think, of considerable interest.

Firstly, With regard to the stricture itself, it is remarkable (1) that a stricture should have existed in such a spot; (2) that it should have been so exquisitively painful to the touch; (3) that the pain should have given rise to paroxysms of hysterical mania. May not some forms of puerperal mania depend upon a uterine lesion acting on an hysterical system?

Secondly, That the stricture was the cause of the miscarriage in this and the previous pregnancy I have no doubt. I have never seen this mentioned as a cause of premature labour. The uterus up to the fifth or sixth month of pregnancy, grows and expands almost entirely in its upper part. At that time it enlarges downwards from the internal os; but in this case the stricture would not allow it to expand, and by continued irritation, induced labour pains.

Thirdly, If this be true, it throws some light upon "What is the cause of labour?"—a point, I believe, still undetermined. If you examine the uterus at the eighth month, you find a considerable portion of the neck still unex-

panded; if you examine at the end of the ninth month, you find the neck entirely obliterated. What happens then? Does the uterus stop growing? No; it still continues to enlarge downwards, and it can only do so by dilating the os. Had this stricture been situated at the external os, the uterus would have gone on growing until the end of the ninth month, and then, just as in the miscarriage, by irritation of the stricture, labour pains would have set in. It is not necessary, however, to invoke the aid of a stricture at the external os to induce labour pains. The os is the most sensitive part of the whole organ; to dilate or to irritate which is to bring on pains. This the natural growth of the uterus does; then, those contractions of the uterus, sometimes painful and sometimes painless, which occur every hour or two during the latter months of pregnancy, recur with greater frequency; the membranes and the head of the child are pushed down upon the os, exciting it more more and more to induce pains by reflex action, until finally the labour is accomplished. This I have long regarded as the explanation of the cause of labour: the natural expansion of the uterus, acting on the sensitive os, begins to dilate it, and through it reflexly the necessary pains are called forth.—*Glasgow Medical Journal, Feb.* 1869, *p.* 156.

87.—CARBOLIC ACID IN THE SICKNESS OF PREGNANCY.

By Edward Garraway, Esq., Faversham, Kent.

Carbolic acid is the only remedy which I have ever found of any avail in pregnant sickness, and of its efficacy here I entertain no doubt whatever. Patients who have had it in one pregnancy, invariably ask for "that tar medicine" in the next. In other forms of sympathetic vomiting, it has proved no less valuable. I quote the two most noteworthy cases I have met with, premising that I am not given to exaggerate.

Miss ——, aged 19, a highly hysterical girl, the subject of pelvic abscess, had vomited every meal immediately after swallowing it for three years. Physic and physicians, of course, had been exhausted upon her. I gave a drop of carbolic acid three times a day. She retained this from the first. After ten doses had been taken—*i. e.*, on the fourth day—a meal was kept down; and from this time she retained alternate meals. In a fortnight, two meals out of three stayed; but the unwonted presence of so much food in the stomach occasioned such distress, that I was induced to partially withdraw the remedy, and allow two out of four meals to be rejected. The carbolic acid, however, was gradually persevered with; and, in the course of a year, the stomach was able to bear and retain four meals a day.

Mrs. ——, at the eighth month of gestation, engaged me to attend her, and complained that she had been sick throughout her pregnancy. I declined prescribing, assuring her that the vomiting would cease immediately after delivery. However, it persisted as before; and she then informed me that for nine years she never passed a day without vomiting, sometimes several times. This condition resulted from an attack of fever. I waited a fortnight after her accouchement, and then put her upon carbolic acid. She never once vomited again. The remedy was continued a fortnight, then gradually withdrawn.

I give drop-doses of the crystal, liquefied by heat, and diffused in half an ounce of thin mucilage, three times a day.—*British Med. Journal, March* 13, 1869, *p.* 235.

88.—ON THE DIAGNOSIS OF ACCIDENTAL HEMORRHAGE FROM PLACENTA PRÆVIA.

By Dr. Edward Calthorp.

The os uteri being unopen, and therefore a physical demonstration of the placenta impossible, any evidence by which we can determine between the

two conditions mentioned at the head of this paper must be of value; I speak of the diagnosis of placenta prævia from accidental hemorrhage in the later months of pregnancy.

We all know, who have had experience im midwifery, the soft, velvety, hot feel of a gush of uterine hemorrhage, when that takes place the hand being in the vagina. It is from the character of the discharge we are to form our diagnosis in the present case.

In a case of placenta prævia—say at the sixth month—the discharge, if any, is blood "pur et simple," and on examination the vagina is most likely full of, or at least contains, clots. In a case of accidental hemorrhage, the discharge is liquor sanguinis, and the vagina free from clots; and it is easy to understand how this is. The blood in placenta prævia comes directly from the uterine or placental vessels, or both, into the vagina, and is there discharged as blood, leaving coagulations behind in the vagina; whereas, in accidental hemorrhage, the blood, before being discharged, has to find its way to the os, separating the membranes as it comes down and depositing its fibrine, so that the discharge is liquor sanguinis, and the vagina is free from clots. How often, in a case of accidental hemorrhage arrested and gone to full term, do we not find, on the placenta being expelled, a large mass of fibrine discharged with it (I have more than one in my possession, and have seen numbers). In like manner, after a confinement in which perhaps a small piece of membranes has been left behind in utero; serving as a nucleus, do we not find the discharge "dirty water," as the nurse says, the uterus large, above the pubes, and the patient weak and blanched; the fibrin is deposited, and the liquor sanguinis discharged; and the mass, if allowed to remain in utero, prevents the proper contraction of that organ, and is often the precursor of disease, retroversion, &c., and may account for the moles, "false conceptions," &c., so frequently described. But this is scarcely belonging to my subject.

Finding no mention, then, in any authority of this mode of diagnosis (one of many) between these most serious complications, and knowing, by experience, that it is fully to be relied upon, except in cases in which the placenta is very near the os, or the hemorrhage very profuse, must be my excuse for publishing these few rough notes.—*Lancet, April* 3, 1869, *p.* 458.

89.—ON A CASE OF POST-PARTUM HEMORRHAGE.

By Dr. F. E. Wilkinson, Sydenham.

The following case may be of some interest as introducing a new mode of arresting uterine hemorrhage. In the year 1860, I was called upon to attend Mrs. G., an hemorrhagic patient (a lady of the middle class), in her first confinement. Parturition was tedious, both from the length of time occupied, in consequence of the insufficiency of the uterine action, and from the occurrence of persistent vomiting; and delivery was accomplished with the aid of the forceps. The placenta was expelled by the natural efforts some twenty minutes after, but the uterus contracted feebly, and shortly afterwards severe hemorrhage took place. I was here ably assisted by my son, Dr. G. F. E. Wilkinson, then a student of medicine, and with his aid ergot and food and stimulants were administered, and cold injections thrown up, but with no success; slight contraction taking place, but the uterus then becoming perfectly flaccid. Hemorrhage continued, and the patient became rapidly depressed. The pulse at the wrist was almost imperceptible, and there appeared every reason to apprehend immediate dissolution. At this trying juncture I observed a large sponge lying in the room; and as both my hands were engaged in endeavouring to control the fearful hemorrhage, I directed that the sponge should be threaded with some strong string, and washed in cold water, when I squeezed it into as small a compass as possible, and introduced it into the uterus. Immediate contraction took place round the sponge, and after gently applying a bandage over the abdomen, and persisting in feeding for some

hours with liquid food at frequent intervals, the pulse became gradually more perceptible, and the patient was rescued from a state of imminent danger. The sponge was expelled into the vagina upon the third day, and was removed by the attached string without difficulty, and the patient recovered more rapidly than could have been expected after such a loss of blood.

I have since used the same plan in several cases of uterine hemorrhage in my own practice and when I have been called in to assist other practitioners, and it has been attended with unvarying success. I believe the plan to be valuable (as in the case I have recorded) in some apparently hopeless cases.

No doubt the elasticity of the sponge keeps up a constant regular pressure upon the whole of the internal superficies of the uterus, whilst its spiculæ orrhage also stimulate the uterus to contract.

I have been in the habit of injecting a weak solution of carbolic acid to arrest fetor, both before and after the sponge is removed; but if it were desired to apply any other remedy, such as the solution of the perchloride of iron, &c., it could not be applied better than by injecting it into the sponge. But one great advantage of this plan of treatment is that it can do no harm.—*Lancet, Feb.* 13, 1869, *p.* 223.

90.—THE INJECTION OF PERCHLORIDE OF IRON IN POST-PARTUM HEMORRHAGE.

By Dr. Robert Barnes.

Dr. Barnes recommends the use of perchloride of iron as an injection in cases of post-partum hemorrhage, where other means of arresting the hemorrhage have failed.]

A very convenient preparation is the liquor ferri perchloridi fortior of the British Pharmacopœia. Half a pint of this may be carried in the "obstetric bag," and when wanted it may be diluted to a quart by adding a pint and a half of water. This dilution should be put into a small deep basin. The syringe most convenient is Higginson's, fitted with a uterine tube about nine inches long. My syringe has a common mount, which is made to fit either the elastic dilators or the uterine tube. Care should be taken that air is not sucked up into the syringe. To avoid this, keep the entrance-tube of the syringe at the bottom of the fluid, and pump through back into the basin until the syringe is filled with the fluid. The apparatus being ready, pass the left hand into the uterus, clear away all placenta and clots, then slip up the uterine tube along the palm of the hand, so as to carry the end of the tube up to the fundus of the uterus; then compress the syringe gently and steadily, so that the fluid may trickle down over the whole inner surface of the uterus. The pumping may be repeated until the basin is *nearly* emptied —not quite, lest air be taken up. As the iron acts by coagulating the blood in the mouths of the vessels, and mere contact is enough for this, it is unnecessary to pump with any force.

The effect of this injection is to corrugate the inner surface of the uterus, and commonly some degree of muscular contraction follows. I have hardly ever known any more hemorrhage to occur after one injection. Henceforth the patient is safe from further loss; and if not already too far exhausted by previous loss, there is nothing to prevent the patient's recovery.

I have practised this plan for several years, and in a great number of desperate cases, where kneading, compression, ergot, cold in every form, had failed, and I have seen no bad consequences from it. Practised with the precautions I have laid down, I believe it is in itself safe, and I am certain that not a few lives have been rescued by it from otherwise imminent death.

I have also used it in cases of excessive flooding attending abortion. But where the uterus is small, and the cervix not admitting more than the finger, I now prefer to apply the styptic on a swab, such as a common probang. I have a strong suspicion that in one case of early abortion, an injection made

too forcibly by means of a caoutchouc bottle was the cause of a fatal catastrophe. The patient died almost suddenly soon after the injection, with symptoms resembling those consequent upon air entering the circulation.

This, the only accident I am acquainted with, suggests caution. But in a desperate emergency, like flooding, we must be prepared to encounter some risk, rather than suffer the patient to lose that little stock of blood in which the life of the patient lingers.—*Lancet, Jan.* 30, 1869, *p.* 175.

91.—OBSERVATIONS ON A CASE OF SUDDEN DEATH AFTER DELIVERY FROM EMBOLISM OF THE PULMONARY ARTERY.

By Dr. W. S. Playfair, Assistant Obstetric Physician to King's College Hospital.

By *embolism* we mean those cases in which a portion of fibrine is detached from a clot in a blood-vessel, and is carried through the circulation until it becomes impacted in another, and possibly very distant, part of the circulatory system, where it may become the nucleus round which fresh fibrine is subsequently deposited. When the fibrine is deposited *in situ*, in the place where it is found after death, the term *thrombosis* is the one which should be used; and it is to be observed that every case of *embolism* must necessarily be preceded by *thrombosis*, for, unless a thrombus or clot exists in some part of the circulatory system, there is no deposited fibrine from which an embolus can be detached.

Although the words can be used in reference to any part of the vascular system, I would wish to be understood as referring more particularly to those cases in which fibrine is found obstructing the right side of the heart and pulmonary arteries; cases which in reference to the puerperal state, are of extreme importance to the accoucheur, and deserve the most careful study.

There can be no doubt that embolism in this situation has been more generally considered the cause of sudden death after delivery than thrombosis. This is the view that has been maintained by Virchow, and by Wade and others who have written on the subject in this country. In fact the possibility of the coagulum forming *in situ* has been almost entirely overlooked. In the paper above alluded to, I ventured to maintain a contrary opinion. I then said: "I believe that a careful examination of the now numerous instances of sudden death after delivery will show that in a large proportion of them there was no history whatever of peripheral phlebitis or venous obstruction from which an embolus could be derived." I am pleased, therefore, to find that Dr. Richardson, who has devoted much attention to the point, considers true embolism to be comparatively rare; and points out, very graphically, how the heart and pulmonary arteries are, from their anatomical arrangements, a likely situation for the separation of fibrine.

It seems to me that the term *embolism* should never be applied to cases of fibrinous obstruction in the heart and pulmonary arteries, unless two conditions are met with on *post mortem* examination. One is the existence of a clot in some part of the peripheral venous system, from which an embolus can be derived; the other is the existence in the pulmonary clots of separate travelled portions of fibrine, corresponding in structure to the peripheral thrombus, round which more recent fibrine is generally deposited. If no clots exist in any of the veins, the case clearly cannot be one of embolism.

Many cases have been carefully examined in which the existence of true pulmonary embolism is beyond all doubt. The following, in which the travelled embolus was not only found, but the exact site from which it was detached also determined, is so remarkable that it seems to me to be well worthy of record.

Jane W., 21 years of age, was admitted into King's College Hospital. under the care Mr. Henry Smith, early in the month of December, 1868, suffering very severely from intense pain on defecation, which was ascertained

to depend on a fissure in the rectum. She was then in the sixth month of her third pregnancy. Two years ago she had suffered in the same way, and her symptoms were then so severe that Mr. Smith had operated on her, although she was then far advanced in pregnancy. No unfavourable results followed, and she had gone to the full time, the rectal symptoms having been greatly alleviated. Encouraged by his former success, Mr. Smith determined to operate again, and this was accordingly done on the 5th of December.

On December 7th, she began to complain of pain in the back, accompanied by a slight discharge of blood, when she was at once removed into a separate ward. Opiates were administered, and the usual treatment for averting premature delivery resorted to. For several days it was hoped that labour might be prevented; for, although slight uterine contractions recurred every now and then at long intervals, the os remained unopened, and there was no discharge. The appetite was good, the pulse quiet and regular, the pain on defecation much diminished, and the patient was in every other respect apparently in perfect health.

Things went on exactly in the same way until December 13th, on the morning of which day she had one or two very slight pains, but was otherwise cheerful and well. Late on the evening of that day, however, her pulse and temperature gradually rose without any evident cause, and at 10 p. m. her pulse was found to be 160, her temperature 103, and her respirations 40. She complained of no pain, and there was nothing to show what could be the cause of this sudden change. Shortly afterwards she vomited a large piece of undigested meat, showing no sign of mastication, which, she stated, she had swallowed accidentally when disturbed during her dinner on the same day.

At 1.30 a. m., uterine contraction had increased in strength; the pulse being now 104, the temperature 100. At 5.45 a. m., the entire contents of the uterus were expelled, the membranes being unruptured.

The condition of the patient was noticed by Mr. Pedler, the resident accoucheur, to be at this time as follows: "She was suffering from extreme dyspnœa, the countenance was excessively pale, her lips white, the face generally expressing *extreme* anxiety. The uterus was well contracted. No pulse could be felt at the wrist, nor at the posterior tibial artery. The sounds of her heart were almost *nil*." In fact, she had all the symptoms of obstruction at the right side of the heart, most characteristically developed. Stimulants were administered freely. The patient called incessantly for air, and said she was being suffocated. She died at 7.45 a. m., and during the last few seconds of her life the face was convulsed.

A *post mortem* examination was made eight hours after death by Dr. Kelly, the pathological registrar to the hospital, from whose notes the following account is abridged. On opening the thorax, the lungs were found collapsed; there were no adhesions or fluid in the pleura; the lungs themselves were quite healthy, unusually light, and containing very little blood. The bronchial mucous membrane was a little congested, and there was no frothy mucus nor pus in the tubes. The heart weighed nine ounces, and was quite healthy in structure. The right side of the heart was extremely distended, and also the large veins of the neck and the two cavæ; the left ventricle was small, and the pulmonary veins were nearly empty. The right side of the heart was filled with a soft black coagulum, on the upper surface of which was a little discoloured fibrine; it had all the appearance of a recent *post mortem* clot. At the bifurcation of the pulmonary artery, plugs of firm fibrine were found obstructing the passage of the blood, more especially on the left side, where they extended for about an inch and a half into the primary divisions of the pulmonary artery. Beyond these the arteries were nearly empty, containing only a little fluid blood. These clots were of a yellowish or buff colour, very firm, but not moulded to the vessel in which they lay, and were very different from the soft gelatinous clot in the right ventricle. They were of a leathery consistence, and were not surrounded by any black coagulum. On section, they were all uniform in colour, and partially laminated, with the exception of one, which

lay across the pulmonary artery, and was nearest to the heart. In the centre of this, was found a piece of fibrine, of the shape of an almond, and three-quarters of an inch long, surrounded by, but separate from, the remainder of the fibrine, which was of less firm consistence. At its base was an irregular surface, which fitted closely to a corresponding rough surface in a clot in the iliac vein. The valves of the heart and large vessels were quite healthy in structure, and none of the clots were adherent. At the junction of the internal and external iliac veins on the right side was a clot of fibrine about two and a half inches long, adherent at its distal end to the internal iliac vein, while its other extremity was free and lay in the common iliac vein, but not filling up the whole of its canal. About its centre was the roughened portion previously described, from which the nucleus in the pulmonary clot seems to have been detached. The uterus was perfectly healthy and well contracted, and its veins contained no coagula.

The symptoms which caused the death of the patient were so characteristic of obstruction of the right side of the heart and pulmonary arteries, that no other diagnosis was possible. They are precisely those which have been described in numerous cases of the kind which have been recorded. The very careful *post mortem* examination conducted by Dr. Kelly clearly showed that this was a true case of embolism. For, first, was found the firm coagulum obstructiug the right iliac vein. showing a ragged portion of the juncture of the right with the common iliac vein, which looked exactly as if a piece of fibrine had been detached from it, and markedly different in appearance from the smooth surface of the coagulum at every other part. Then in the pulmonary arteries were found various masses of fibrine obstructing their calibre, and in the centre of one of these a separate nucleus of fibrine, differing in texture from that surrounding it, and presenting at one extremity a jagged portion, *which accurately fitted the corresponding point in the iliac clot.*

It is very clear, therefore, what had occurred. At some period during the eight days which elapsed between the operation and death, a coagulum had formed in the iliac vein. The portion found in the centre of the pulmonary coagulum had become detached, and was carried through the venous circulation until it was arrested in the pulmonary artery. This, probably, corresponded with the sudden rise in the pulse and temperature on the evening preceding delivery. During the night, the fresh fibrine which surrounded it was deposited, and the pulmonary arteries became more and more obstructed until death ensued. The original coagula in the iliac veins seem to have caused no symptoms, or at least none that were observed.

This explanation of the phenomena is necessarily theoretical, but it is, I believe, the only one which will fully account for the symptoms, and it is strictly in accordance with what has been observed in other cases which have been recorded. There is one difference, however, between this and every other case of undoubted pulmonary embolism after delivery, which I have yet met with, which is worthy of remark. I have shown by an analysis of twenty-five cases after delivery that, in twelve which were probably due to embolism, the death occurred a considerable time after delivery—generally after the nineteenth day; while, in the remaining fifteen, where the coagulum apparently formed *in situ*, the fatal result occurred at a much earlier period. I explain this curious difference on the supposition that embolism must be preceded by the formation of a blood-clot in some of the peripheral veins, in consequence of a similar blood-dyscrasia to that which produces primary coagulation in cases of pulmonary thrombosis, and occurring about the same time after delivery, and it is not till then the clot so formed has had time to change and soften that a portion of it becomes detached and carried through the circulation to the heart.

In the case above narrated, however, the embolus seems to have been detached *before* delivery. The difference is probably due to the fact that

the iliac clot was formed during some portion of the eight days which elapsed between the operation and the death of the patient; and its original deposition may have been produced by some blood-changes resulting from the operation itself. In the absence of any definite data as to the exact time at which it was formed, there is nothing to prevent us from believing that a sufficient period had elapsed to allow of those retrograde metamorphoses of the fibrine which favor the separation of a portion. As this is the only case in which death so nearly coincided with delivery, and as it was preceded by an operation, it seems a very fair inference that the operation was in some way the determining cause of the coagulation in the iliac vein, from which the embolus was derived. There can be no doubt that the alteration in the blood due to pregnancy favoured the recurrence; but, beyond this, it is questionable whether the delivery itself had anything to do with it; and I see no reason to alter the conclusion at which I formerly arrived, "That embolism usually occurs at a much later period after delivery than thrombosis; and that spontaneous thrombosis probably corresponds with, and is due to, some cause similar in its nature to that which produces the obstruction of the peripheral veins in true cases of embolism.—*Brit. Med. Journal, March* 27, 1869, *p.* 282.

92.—PROLAPSUS UTERI OF SEVENTEEN YEARS' STANDING CURED BY OPERATION.

Under the care of Mr. Norton, at St. Mary's Hospital

The patient, whose case is appended, is at the present time—a year and a half after the operation—a milk carrier in London; and though the weights she bears are excessive, there has been no return of the disease, nor have there been any bearing-down pains. She continues in perfect health.

Mrs. M. had laboured under the severe effects of an extensive prolapse of the womb since the birth of her last child, a period of seventeen years. She stated that she was unable to walk, or in any way to gain a livelihood, and that she was only free from pain when lying down.

On examination, the uterus was found altogether external to the vagina. It was much enlarged, thickened, and indurated, and around the os, and upon different parts of the vagina, were several small ulcerations. Pessaries of various forms had been used to support the womb, but without effect.

Mr. James Lane saw the patient with Mr. Norton, and it was determined that the operation which Mr. Lane had performed on several occasions should be adopted.

On the following Wednesday Mr. Norton removed an eliptical piece of the mucous membrane about three inches and a half in length, by two in breadth, from the vesical wall of the vagina. The cut margins were then brought together by means of ten silver-wire sutures, and the uterus returned to its normal position. The bowels were confined by opiates to the sixth day, and then relieved by castor oil. The vagina was syringed daily with warm water, and after eight days the sutures were removed.

Fourteen days after the first operation, Mr. Norton removed by a horse-shoe incision rather more than an inch of the mucous membrane of the posterior and lateral walls of the vagina, including the cutaneous margins of the fourchette. The denuded surfaces were now approximated as in the operation for ruptured perineum, and were firmly fixed by means of silver-wire quilled sutures. The projecting lips were more evenly adapted by a second row of wire sutures somewhat deeply placed. As on the previous occasion, the bowels were quieted by opiates throughout the week. The quilled sutures were removed after forty-eight hours, and the others in seven days. On the removal of the quilled sutures a few drops of pus exuded, and the parts round showed some little redness and induration, but these symptoms were relieved by a bread-and-water poultice.

Within a fortnight after the second operation the patient left the hospital entirely cured.—*Lancet, Jan.* 23, 1869, *p.* 121.

93.—ON THE DIAGNOSIS AND TREATMENT OF UTERINE POLYPI.

By Dr. George H. Kidd, Obstetric Surgeon to the Coombe Lying-in Hospital, Dublin.

A polypus in the cavity of the body of the uterus causes the whole organ to grow in the same way that the ovum does in early pregnancy. Hence the cavity becomes enlarged and elongated, and the walls thickened and hypertrophied. If the polypus be of any size the fundus of the uterus will be felt in the hypogastric region, of irregular form, it may be, depending on the form of the polypus. When the enlargement is not so great it may still be recognized by the finger in the vagina, and the fundus may be traced by the bi-manual method of Marion Sims, but even though we have hemorrhage and the other symptoms enumerated, along with an elongated uterine cavity as measured with the sound, and an enlarged and irregular fundus, we cannot absolutely declare the existence of a polypus, inasmuch as all these signs, like the symptoms, may depend upon other causes.

Moreover, not only may these signs and symptoms exist without there being any polypus present, but we may have a polypus without any enlargement of the uterus, as when it grows in the cervix, and is of the small size usual in this situation, or when, even though in the cavity of the body of the uterus, it is of such small size that the elongation of the cavity, as measured with the sound, is scarcely appreciable; and yet, small as the growth is, it may, if not removed, run the patient down by hemorrhage.

The only certain proof of the existence of a polypus is the detection of it by the eye or finger, and, therefore, when from persistent hemorrhage or other cause, we suspect the presence of such a growth, and cannot otherwise discover it, we must dilate the uterine canal so as to be able to pass a finger to the very fundus, and make a minute and careful digital examination of the cavity throughout its whole extent.

[The use of sponge tents for facilitating explorations of the uterine cavity dates from 1844, when they were introduced by Sir James Simpson. They have, however, several disadvantages, such as requiring repeated applications of them, to get at the cavity of the uterus, and becoming fœtid when allowed to remain a few hours in the uterus.]

The sea-tangle is free from all these objections, and seems to me not only to supply the boon to surgery desired by Marion Sims, by being an efficient, pleasant, and cheap substitute for sponge tents, but to be more easy of application, more prompt in dilating the uterus, and above all, more safe in its action.

When the uterine tissues are relaxed by hemorrhage, a fine tent can be passed at once through the whole length of the cervix and on to the fundus, and by a little care a number of fine tents can be packed alongside of one another in the canal, when a single large one, though not nearly of the size of the bundle so formed, could not be passed at all. The first tent introduced serves as a guide to the others, and when they absorb fluid and swell out, they not only dilate the os internum as much as the os externum, but also the cavity of the uterus itself, and thereby provide room for the manipulations necessary for the removal of the polypi, if any are found to exist.

I first used sea-tangle tents in the manner now described in the case of a lady, residing some miles out of Dublin, whom I was asked to see by my hospital colleague, Dr. Sawyer, on the 4th of May, 1867, on account of persistent hemorrhage, when it answered the purpose so well that I have ever since adopted the same method, and with the most satisfactory results. In one case, where the patient, though married seven years, had never borne children, the os was so small that it was necessary to leave a single fine tent

in it for some time before a sufficient number could be got in to effect a dilatation large enough to admit the finger, but it is the only case I have met with out of a large number where such a proceeding was necessary.

When it is determined to explore the uterus after this manner the patient is placed in the usual obstetric position, and the length of the uterine cavity is carefully measured by means of the sound. A No. 5 or 6 sea-tangle bougie is now cut into pieces a little longer than the uterine cavity, and the ends rounded off and smoothed. The patient is now desired to put her left arm behind her back, and to lie almost completely on her face, with her right leg drawn up and thrown in advance of the other—that is, in the semi-prone position of Sims. The "duck-bill" speculum is now introduced and given to an assistant to hold, the anterior lip of the os uteri seized with a fine tenaculum, the os having been brought into view and steadied in this manner, as many of the pieces of sea-tangle as can be got in without using force are passed one after another, till they almost touch but do not press on the fundus. Five or six pieces of a No. 6 bougie will dilate the uterus sufficiently for all purposes; and when these have been got in, the tenaculum and speculum are withdrawn and the patient is settled in bed, when a morphia suppository may be administered. If the uterus make expulsive efforts, it may be well to leave a pledget of cotton in the vagina; but if the tents do not actually touch the fundus, the uterus does not generally try to expel them.

At the expiration of twenty-four hours the exploration may be proceeded with. The tents are easily removed by seizing them one after another, with a toothed forceps. The patient must now be brought fully under the influence of chloroform, and then placed in the semi-prone position as before, when the anterior lip of the uterus must be laid hold of by means of a large strong vulsellum, and slowly and gradually, but steadily, drawn down to the vulva. If the blades of the vulsellum be not strong and firm they will spring at this stage of the operation and tear the uterus, and the instrument must be made so that the points when closed, will fairly meet and glide past one another without making fresh openings in the tissues, and when completely closed the blades must have ample space between them for the lip of the uterus, that it may not be in any way compressed, no matter how firmly the handles are held.

The uterus being brought down and fixed in this way, the vulsellum is given over to an assistant, who is directed to hold it steadily, and the forefinger of the right hand is now passed up into the uterus and its interior carefully examined, which will be much facilitated by placing the left hand over the fundus and pressing this part down on the finger. If a polypus be discovered a tolerably fine vulsellum is now passed along the finger in the uterus, and guided by it to the tumour, which is then seized. The finger is now withdrawn, and an ecraseur, armed with a single soft iron wire, is passed in, guided by the vulsellum in which the polypus is held. The loop of the wire is first passed over the handle of the vulsellum, and then the point of the ecraseur is placed against the blades of the vulsellum and run up as far as it will go.

The finger may now again be passed into the uterus so as to press the wire well down on the polypus; but if the eye of the ecraseur be passed well up to the uterine wall it will of itself draw the wire into its place. When the ecraseur is fixed in its place it is held steadily, and the wire slowly screwed up till it cut through the peduncle, when ecraseur, polypus, and vulsellum all come away together. The finger should now be again passed in, and if no more tumours be discovered the interior of the uterus may be brushed over with a saturated solution of the perchloride of iron in glycerine, and the patient may be put to bed and allowed to sleep off the effects of the chloroform. For a few days the vagina should be syringed out with tepid water.

I have now operated in many cases by this method, and I have also tried the plan of passing the entire hand into the vagina instead of drawing down the uterus, and also the plan of pressing down the uterus by a hand placed over the hypogastrium without passing the hand into the vagina or using any vulsellum for drawing it down, and am convinced that these methods do more violence to the surrounding parts, are less efficient, and are more irk-

some to the operator than the proceeding just described. If the polypi be large and come into view, or can be seized, the drawing down of the uterus is, of course, unnecessary; but when they are small and concealed from view, I am convinced the foregoing is the safest way of operating.

Intra-Uterine Fibrous Polypi.—Intra-uterine fibrous polypi arise most frequently from the fundus of the uterus, or that portion lying between and above the openings of the Fallopian tubes, but they may also arise from some portion of the walls of the body, and are very rarely met with springing from the walls of the cavity of the cervix. Arising in any of these situations the polypus commences as a round submucous elevation which in general becomes pedunculated, and suspended with its largest portion free in the distended cavity of the uterus, but it sometimes remains sessile. In either case it may in the progress of its growth come to rest on and close the os internum, forming there a sort of ball valve, and preventing the exit of any fluid that may be poured into the cavity of the uterus. More frequently the tumour passes through the os, and (the peduncle becoming elongated) is gradually extruded from the cavity of the uterus, when it may be found either completely or partly protruded through the os externum, and may be easily recognized and easily removed. Generally speaking, they are single, but not unfrequently we find rudiments of smaller ones, consisting of submucous round elevations adjoining large polypi. Klob, indeed, says that sometimes two are found flattened from contact, but rarely more than two, and in the majority of cases only a single one; and West, contrasting them with fibrous tumours on the outer surface of the uterus, which are seldom solitary, and often very numerous, says, it is rare to find more than one projecting at the same time into the cavity of the uterus. This he thinks due probably to there not being room for more than one tumour at a time within the cavity of the womb, for it is not a very uncommon thing, he says, some months after the removal of one growth, to find another occupying the same situation, producing the same symptoms, and calling once more for a recourse to the same operation. In one case, however, twenty-nine fibrous polypi were removed within twelve months, at four operations, three at the first, nine at the second, eleven at the third, and six at the fourth. In this respect the case is, so far as I can learn, unique, no similar one having been recorded by any author with whose writings I am acquainted.

Case.—Menorrhagia lasting Fourteen Years—Twenty-nine Fibrous Polypi Removed from the Cavity of the Body of the Uterus at Four Operations.—Miss A., an unmarried lady, aged 36, was placed under my care by Dr. Martin, one of the physicians to Jervis-street Hospital, on the 22nd August, 1867, and admitted by me as a patient into the ward for diseases of women, in the Coombe Lying-in Hospital. She had been a governess, but been reduced to poverty by ill health, consequent on menorrhagia, from which she had suffered for 14 years. During this time she had been treated by several physicians, and in many hospitals; but, till she came under my care in the Coombe hospital, and I insisted on being allowed to do so, no examination of the uterus had been made. When I examined it I found it enlarged so that the fundus could be felt above the pubes. It was somewhat irregular in its outline, and its cavity measured an inch longer than it ought to do, but the os and cervix were apparently quite healthy. She was blanched from the loss of blood, her extremities were œdematous, her breathing was short and panting, and her debility was extreme. On consultation with my hospital colleagues, Drs. Ringland and Sawyer, and with Dr. Beatty, who kindly saw the case with us, it was agreed to explore the cavity, and for this purpose six pieces of sea-tangle were introduced on the 5th of September, 1867, in the manner just described. On the following day the finger was passed into the cavity up to the fundus with great ease, and so well was the canal dilated that we could even see one of the tumours lying above the os internum. Three tumours, each as large as a pigeon's egg, were found and removed with the ecraseur. The patient was kept in bed for a week, but suffered no pain or inconvenience, and at the expiration of ten days left the hospital.

For a time the menorrhagia ceased and she improved in health, but the

hemorrhage gradually returned, and in the month of March, 1868, she applied to be re-admitted into the hospital. The uterus was enlarged even more than it had been before, and again we dilated it and found a group of tumours filling it up. Dr. Beatty was still good enough to lend his valuable assistance, and with his help and that of my colleagues, I removed nine polypi, some of them large and pedunculated, others as small as a pea and sessile.

She recovered from this operation quite as well as on the previous occasion; but, although every tumour that could be discovered was carefully removed, the uterus never resumed its normal size; it remained large, and could still be felt above the pubes. The next menstruation was, however, healthy, both as to the quantity and character of the discharge; but in April the hemorrhage returned, and in May it was as bad as it had ever been, if not worse. The uterus was now greatly enlarged; it could be felt above the pubes as large as a man's shut hand, and the sound passed into its cavity nearly four inches. On the 16th May we again dilated the os, which was as small and apparently healthy as ever. We now removed eleven tumours, four of which were pedunculated and grew from the fundus, and were nearly as large as any of those that had been previously removed; the others were smaller and sessile.

After they were all removed we painted over the whole surface of the uterus very freely, with a saturated solution of the perchloride of iron in glycerine. For some days after the operation there was fulness, with pain and tenderness, in the lower part of the abdomen; but these symptoms quickly yielded to the use of poultices and injections of tepid water into the vagina, and on the tenth day the patient was able to be up and going about. The uterus, however, scarcely diminished in size. The os closed completely, and got into its normal state, as it did after the previous operations, but the body remained large and prominent above the pubes. No menstrual or other discharge took place till the 29th June, when it again occurred, and became hemorrhagic in character and very profuse. Consequently, on the 11th July, I again dilated the uterus, assisted as before by my hospital colleagues and Dr. Beatty, and by Drs. Churchill, M'Clintock, Atthill, and Collis, and I removed six tumours, one as large as a hazel nut, the others smaller in size.

After their removal I applied strong nitric acid freely over the whole of the inner surface of the uterus. On the next day the patient expressed herself as feeling less uncomfortable than after any of the previous operations; the pulse was 104; there was no tenderness of the abdomen; and the only complaint she made was of having a very offensive discharge from the vagina. I had ordered her a grain of opium every second hour after the operation. I now prolonged the interval to every fourth hour, and ordered the vagina to be syringed out, and a poultice to be applied over the hypogastrium. The following day the pulse was down to 96, and there was no fulness, pain, or tenderness, and the day after the pulse was down to 80. There was some purulent discharge from the vagina, but not offensive, and she wished to sit up, which, however, was not allowed, but the poulticing and opium were discontinued. I believe this is the first time strong nitric acid has been applied to the interior of the uterus. I used it at the suggestion of Dr. Ringland, to whom we are, I believe, also indebted for the first suggestion to use this acid in affections of the os and cervix.

The uterus diminished much in size after this operation; it sunk down into the true pelvis, and could no longer be felt above the pubes. On the 1st of August, exactly three weeks after the operation, I made a careful examination. The os was closed, the cervix was in its normal condition, there was no discharge. Examined by the bi-manual method of Marion Sims the fundus could be found regular in its outline, but rather larger than natural, and when measured with the sound its cavity was found to be nearly an inch longer than it ought to be. This patient was kept in the hospital, partly that she might have the benefit of good nourishment, and partly to watch the case; but as the next menstruation was perfectly healthy, she became anxious to leave, which she did on the 9th of October, 1868, and in a short time afterwards undertook engagements as a visiting governess, which she has since

continued to fulfil. On the 6th January, 1869, she called on me at my own house, and reported that her menstruation had continued quite healthy—that the periods since she had left the hospital had lasted only four days each, and that she only required to use two napkins each day, notwithstanding that she had to walk a great deal, even during the period, in attending to her pupils. She said she felt strong and well, and "had got a blush in her cheek," all of which her appearance confirmed.—*Dublin Quarterly Journal, Feb.* 1869, *p.* 10.

94.—RECENT EXPERIENCE IN OVARIOTOMY.

By T. Spencer Wells, Esq., Surgeon to the Queen's Household.

Since last October I have completed the operation of ovariotomy in this Hospital in thirty-six cases, besides one case in which I performed the operation successfully for the second time on the same patient. Of the thirty-six women, thirty-one recovered and five died. And it is a remarkable fact that in *every case* in which the pedicle was long enough to enable me to use the clamp the patient recovered. There were thirty of these cases—thirty clamp cases in one year without a single death. In two cases I used the cautery. One of the patients recovered, and one died. In four cases I tied the pedicle, and returned it into the cavity of the abdomen after cutting off the ends of the ligature. All these four patients died. Two of them must have died, I think, in whatever manner the pedicle had been treated. They were almost hopeless cases, and the operation was done as a forlorn hope. In one case the patient was sinking fast from septicæmia, a cyst filled with fœtid fluid and poisonous gas having been washed out repeatedly, but ineffectually, with carbolic acid, and it was at last removed with only the very faintest hope of saving life. In the other case, extensive pelvic adhesions and disease of both ovaries had been pretty accurately made out, and had led to repeated tappings rather than ovariotomy. But at length, when tappings became of no avail, the cysts were removed, with some slight hope but with far greater apprehension. A clamp could not be used in either case. The pedicles were too short. The cautery might have been used; but the pedicles were of the kind where the cautery is often ineffectual in stopping bleeding—broad, thin, membranous attachments, with large vessels. In such cases the ligature succeeds well in stopping bleeding; but whether the ends are left hanging out through the opening in the abdominal wall, or are cut off short and returned with the pedicle, the results in my hands have been almost equally unsatisfactory. Other operators have been much more satisfied with the ligature than I have been, and every one must be guided very much by his own experience. But when I look back over the work of the past year in this Hospital, where all the patients have been treated in all other circumstances under similar conditions, and find no single death in thirty clamp cases, but every one a recovery, while of six cases treated otherwise five die, you will hardly wonder that I use the clamp whenever I can, especially as very similar results have been obtained in private practice. It is true, as I have just said, that two of these five deaths would probably have happened even if I had been able to use a clamp. But three of the deaths I attribute principally, or entirely, to the fact that, as I was unable to secure the pedicle outside the peritoneal cavity, I was driven against my will to the cautery or the ligature. Twice I used the cautery. In one it stopped all bleeding, and the patient recovered. In another it only stopped the smaller vessels, the larger having to be tied, and this patient died; so that her death might be added to that of the four who died after the return of the tied pedicle. Or if, as I think it is fair to do, we put aside (so far as the treatment of the pedicle is concerned) the two cases which probably must have died however the pedicle had been treated, we have three cases where death followed the use of the ligature; and, so far as I can judge from observation of similar cases, these three

patients would probably have recovered if the pedicles had been long enough for a clamp to have been applied and fixed outside the peritoneal cavity.—*Med. Times and Gazette, Nov.* 28, 1868, *p.* 605.

95.—ON SOME POINTS CONNECTED WITH THE TREATMENT OF THE PEDUNCLE IN OVARIOTOMY.

By Thomas Bryant, Esq., Surgeon to Guy's Hospital.

[The following case was reported for Mr. Bryant, by Mr. J. W. Morrison. The patient was a single woman, aged 36, she first perceived an enlargement in the belly sixteen months before her admission into Guy's Hospital. This enlargement was apparently on the right side. She was tapped on September 21st, to make the diagnosis sure, for it was uncertain how much of the fluid was ascitic.]

Nearly four gallons of a very light coloured fluid, slightly sticky, containing cholesterine, were drawn off, a large solid ovarian mass remaining. No bad symptom followed this operation, but by the 3rd of October the abdomen was nearly as large as ever.

On October 4th, therefore, ovariotomy was performed; Mr. Bryant, as usual, operated in a private ward with only such visitors present as were free from all dissecting-room, post-mortem, or other septic influences. He made an incision about six inches long below the umbilicus, tapped the abdomen, and evacuated some quarts of ascitic fluid; a semi-solid ovarian cyst then came into view, which was also tapped, and two quarts of a white, highly gelatinous fluid were drawn off. The tumour, which proved to be connected with the left ovary, was then drawn out, and its peduncle secured in two portions with strong whipcord ligatures. The tumour was then separated from its peduncle about half an inch above the ligatures; these were cut off close, and the whole was dropped back into the abdominal cavity. The wound was closed with smooth silk sutures, an opium suppository was given, and the patient was placed in bed, water dressings being applied to the wound.

A little chloroform sickness followed the operation, but disappeared on the second day, and everything went on favourably.

The patient was allowed iced milk, of which she took freely.

On October 8th, or fourth day, the wound had healed. The sutures were consequently removed, some broad pieces of strapping being put on to keep the parts well together. There had not been any pain in the abdomen since the operation, nor any distension.

On October 11th, or seventh day, the strapping became loose, some ascitic fluid having made its way through an opening in the wound; it came with a rush during the night. This somewhat alarmed the patient, but on examination a very little gaping of the wound was found, and in all other respects, the patient was comfortable. The bowels had been acting naturally during this period.

October 12th. Last night some diarrhœa set in, several loose stools having been passed; it was checked, however, by a dose of chalk mixture. The patient subsequently seemed very comfortable; she was free from all pain and abdominal tenderness. Her pulse was good, tongue clean, aspect healthy; she took her food also with a tolerable appetite.

October 15th. Diarrhœa again set in, with some little abdominal tenderness at the lower part of the wound.

On October 17th a fluctuating swelling appeared at this part, this swelling being clearly tympanitic. The diarrhœa was again checked with a dose of chalk mixture, and the fluctuating swelling opened naturally on the 18th, and liquid fæces made their escape. No signs of other mischief existed. The nurse was directed to examine the fæces which passed through the artificial anus with great care, to see if any ligatures came away.

In four days, or by October 22nd, this aperture closed. Everything appeared to be going on well for one week, when diarrhœa again set in and the artificial anus again opened; fæces passed through the wound freely, and on October 29th the double loop of ligature by which the peduncle had been secured came away. In another three days the wound had again healed, and in three weeks the patient left the hospital perfectly well.

Remarks.—The main point of interest in this case just recorded is the discharge of the ligatures by which the peduncle had been secured through the artificial anus at the lower part of the wound; such a result is in my experience quite unique. Indeed, amongst twenty-four cases in which I have adopted the practice of dropping into the abdominal cavity the loops of the divided ligatures with the peduncle, this is the only one in which any untoward result has to be recorded which was clearly due to the practice itself. But in this instance there is hardly room for doubt that the ligatures by their irritation caused the diarrhœa, and that it was through an ulcerative process that they formed a communication with the intestine, and were discharged externally.

Such a case as the above clearly tells against the practice adopted, and although by itself it may not be sufficient to prove the practice unsafe or inexpedient, it is enough to lead us to think that where a ligature can be left outside the abdomen without inconvenience, such a method had better be followed, and that although in certain cases the plan of dropping into the peritoneal cavity the end of the divided peduncle with the ligatures cut off close may be a good one, it is not free from its own special risks, and that we are still to look for some simpler or better plan by which the peduncle may be treated.

What that plan may be it is at present impossible to decide, but any method that leaves a foreign body within the abdomen is far from perfect. In one case which has been under my care within the last year, some half dozen ligatures had to be employed and were left in, and although for a time everything seemed to be going on well, a fatal result ultimately ensued, when the ligatures were found in the abdominal cavity resting in their own depôts of pus, having been thrown off from their attachments, and acting as foreign bodies. In two other cases which terminated favourably the silk ligatures by which omental adhesions had been secured were also discharged externally through the wound.

On the other hand I could quote two cases which went on without one bad symptom, in which four and six ligatures respectively had been employed without the slightest evil, the patients leaving the hospital well after an uncomplicated and steady convalescence; and many others could also be given in which the peduncle alone had to be secured and in which good results ensued.

I am free, however, to confess that the cases above mentioned have made me somewhat dissatisfied with the plan of treatment to which the peduncle has been subjected, although for short peduncles and broad attachments I at present know of no other which can be preferred; to the long and narrow peduncle the clamp may be as applicable, to say the least of it, and perhaps more so; still in other cases this plan of treatment by the clamp is far from satisfactory. Where the peduncle is short or broad it is certainly objectionable; for by the clamp fixed externally there is invariably traction upon the uterus and its ligaments, and this traction is the source of great irritation and consequently of danger.

I had hoped that in the actual cautery we should have found the right means of treating the peduncle as well as omental and other adhesions. In fact some evidence has been given favourable to the use of the actual cautery in these cases; but I regret to say that in my hands it has certainly failed. In the case of a girl aged 22, whom I operated upon on Nov. 20th, 1868, I burnt down the peduncle with the galvanic cautery with the greatest facility, and also large omental adhesion, but hemorrhage took place in the latter from a large vessel, the size of the ulnar artery, as well as from another point. I consequently ligatured the whole.

I must admit also that from the appearance of the carbonised surface I should not have returned it into the abdominal cavity without some misgiving, and I cannot help thinking that it must be as much a foreign body as a thin whipcord ligature. Still, from one case it is hardly fair to draw any conclusions, for if the peduncle had been the only part which required division, I should certainly have dropped it back tolerably satisfied with the effect of the cautery, and good success might have followed. It was perhaps unfortunate that in the omentum so large an artery as I have described should have existed, for it is unusual.

There is another lesson to be learnt from this case which must not be omitted, and it refers to the application of the ligature to the peduncle. That the peduncle should be tied in halves, is a point which is generally recognized and needs no comment; but that the ligatures should be crossed is perhaps not sufficiently followed in practice. By doing so the chance of tearing the two halves of the peduncle asunder, and the danger of lacerating important parts are done away with. Again, should the ligatures set up ulceration in the part, they will both come away together, as in the case I have related.

It is well also to perforate the peduncle with a blunt-pointed probe, for a sharp needle may puncture a vein or other vessel, and thus cause a troublesome hemorrhage; in a case I had some years since such a result took place, and taught me the lesson I now repeat for the benefit of others. In ovariotomy success seems to turn much upon what appear to be small points, but as a life is often involved in their consideration, too much attention cannot be given to any that are of value. The one I have mentioned must consequently be regarded as an important one.—*Guy's Hospital Reports, Vol.* 14, 1869, *p.* 228.

96.—ON THE OPERATION OF CÆSARIAN SECTION.

By Dr. Robert Barnes

The *instruments* required are:—1. A sharp bistoury. 2. A bistoury having a blunt end. 3. A director such as is used in ovariotomy. 4. A large probang armed with sponge. 5. Artery-forceps and ligatures in case of bleeding from the abdominal wound. 6. New sponges. 7. Ice. 8. Two powerful apparatuses for inducing local anæsthesia by congelation, or chloroform. 9. Silver or silk-sutures for uterine and abdominal wounds. 10. Lint. 11. Many-tailed bandage and adhesive plaster.

Assistants.—Skilled assistants should stand one on each side of the patient. Another should be free to hand instruments and assist in sponging, &c. A nurse or two to help will complete the *necessary staff.*

Preparation.—The bowels should be emptied by castor-oil or by enema on the morning of the operation.

The Operation.—*Position.*—The patient is laid on a table on her back, with the head and shoulders slightly raised. The operator stands on the patient's right an assistant stands on each side.

The *catheter* is introduced to empty the bladder. If the case be one of osteomalacia, explore for the last time carefully to ascertain if the pelvis can be opened up by dilatation by the hand. In this way, twice at least, the operation has been avoided. It is related that a young surgeon, burning with the ambition to perform the Cæsarian section, invited his *confrères* to assist. Everything was ready, when Osiander requested permission to examine. He opened up the pelvis, turned, and extracted a live child; and thus, says he, "I saved the woman from the Cæsarian section and from death." Dr. Tyler Smith has also related a case in which he was able to dilate the pelvis with his hand, and deliver after craniotomy.

In cases of great distortion, the uterus is not seldom found considerably displaced. Where there is great prominence of the sacral promontory, and squatting of the chest down upon the flanks, the uterus is necessarily thrown much forward, sometimes so as to overhang the symphysis. With this there

is occasionally marked lateral obliquity; and, what is less common, but still likely, a twisting of the uterus on its long axis, bringing one of its sides to look more or less forward. This was noticed in Dr. Hicks' case.

It is also desirable to take note, by auscultation, of the seat of attachment of the placenta. Assistance may also be obtained by laying the hand flat on the uterus, when, if the walls are thin, a peculiar thrill or vibration marks the seat of the placenta, which is confirmed by feeling the part bulging a little, as if a segment of a smaller globe were seated on a large spheroid. This has been pointed out by Dr. Pfeiffer (*Monatsschr. f. Geburtsk*, 1868.)

The uterus is then brought into proper relation with the linea alba, so that the two incisions may correspond, unless it be found that the placenta can be avoided by cutting a little on one side of the median line. The abdominal incision is best made in the *linea alba*, extending from below the umbilicus to within abont three inches of the symphysis pubis. When nearly through, it is desirable to get a finger through a small opening, and, using this as a director, to cut from within outwards, so as to avoid scratching the uterus. The assistants support the abdominal wall on either side, looking out to prevent the escape of intestine. The *uterine incision* is made in the middle line, sparing the fundus and lower segment as much as possible, as these parts are not well adapted to close by contraction. Circular fibres predominating near the cervix tend to make the wound gape. A manœuvre described by Winckel, and forced upon him by his being often called upon to operate with insufficient assistance, here deserves attention. An assistant hooks the forefinger of each hand in the upper and lower angle of the uterine wound, and, lifting them up, fixes them in contact with the corresponding angles of the abdominal wound. This shuts out the intestine effectually and tends to prevent the blood from running into the abdominal cavity.

If the placenta is found directly behind the wound, the hand of the operator, is insinuated between the placenta and the uterine wall, detaching it until the edge is felt, when the membranes are pierced, and *the child is seized by the feet.* This point obstetricians will pardon me for prominently emphasising, because I have seen a surgeon pull at the arm, and fail to extract the child. Sometimes the neck is tightly grasped by the uterine wound. If the constriction does not soon yield, it is better, says Scanzoni, to extend the incision than to drag overmuch, lest the wound be torn.

When the child and placenta are removed, attention is required to watch the bleeding; this generally takes place from the cut sinuses in the uterine walls, less frequently from the inner surface from which the placenta has been separated. Hemorrhage is best checked by direct compression of the uterus with the hand; if the uterus contract well, the hemorrhage ceases. Ice may be applied to the wound, and a piece placed in the uterine cavity.

Before closing the wound, *thrust the probang through the os uteri and vagina*, to make sure that the natural passages are clear for the discharges from the uterus.

The Closure of the Wound.—When the bleeding has ceased, and any blood that may have found its way into the abdomen is removed, we have to consider the question of applying sutures to the uterine wound. It is a matter of observation that in many fatal cases the edges of this wound have been found flaccid and gaping. But in the majority of, if not in all, these cases the operation had been performed on women exhausted by protracted labour; and, on the other hand, in women operated upon at a selected time, when the powers are unimpaired, the uterus commonly contracts well. Winckel says he has never lost a case from hemorrhage, and has not stitched the uterine wound. Mr. Spencer Wells has had a successful case in which he used a long piece of silk as an uninterrupted suture, leaving one end hanging out through the cervix and vagina. By pulling on this end the suture was removed after several days.

Another mode of suture would be to carry the same suture though the uterine and abdominal walls, so as to secure adhesion between the two parts. A serious source of danger is from vomiting: the straining and relaxation attending this accident tend to promote the opening of both wounds, and to

force the discharges through them. This risk would be lessened by uterine sutures. Upon the whole the case may be stated thus:—If the patient is operated upon at a selected time, if the danger of vomiting is lessened by not taking chloroform, and if the uterus contracts well during the operation, the sutures may be dispensed with; but under the opposite circumstances, it would be better to stich the uterus as was done in Mr. Spencer Wells's case.

Closure of the Abdominal Wound.—The methods adopted in ovariotomy may be followed. I am inclined to prefer the uninterrupted silk suture. Winckel's cases were closed by the more common method of interrupted sutures, with intermediate skin sutures. The important point is to *close the wound completely.*

After-treatment.—A full dose of opium should be given immediately either in form of pill or suppository. Light nourishment and perfect repose are the things to be observed. The dressings should not be removed for five or six days. To obviate foulness, sprinkling with Condy's fluid or weak carbolic acid may be resorted to. The sutures may be removed on the seventh or eighth day. The bowels may be relieved by enema on the fourth or fifth day.

What is the risk to life attending the Cæsarian section, numerically expressed? I have already made some remarks upon this, the statistical aspect of the question. I doubt if any satisfactory answer can be given. Can any quasi-analogical deduction be drawn from the mortality attending ovariotomy? Take this to be one death to two or three recoveries; may we expect a similar result from the Cæsarian section—I mean, of course, when performed at a selected time? It would be rash to expect an equal success; and there is a consideration which, I think, is generally neglected by obstetricians. It is this: we are not justified in treating the particular patient whose case is before us as an abstract entity, a mere arithmetical unit. Her fate is not to be decided by what are called statistical laws, but which are in reality too often nothing better than the accidental issues of blind gropings. We must study case by case; compare them; analyse clinically. "Non numerandæ, sed perpendendæ sunt observationes."

The Dangers of the Operation and Prognosis.—The principal risks run are as follows:—

1. If the operation is performed as the last resource after protracted attempts to deliver by other means, the woman is liable to sink from shock and exhaustion within a few hours; or if she survive beyond a few hours, there is the risk of hemorrhage, of peritonitis, and of puerperal fever. It may be said that the prospect of recovery, when the operation is performed under these circumstances is very small.

2. If the operation is performed at a selected time, the woman escapes the shock attendant upon the protracted labour, and encounters the shock of the operation with unimpaired strength. Still, the shock is very great, and is not seldom fatal *per se.* This is the first and most pressing danger. Could it be in any way modified or controlled, the Cæsarian section might be undertaken with more confidence. But shock necessarily attends all severe abdominal injury. It affects different persons in different degrees. Nor can we readily predicate of any given person that she will bear shock well or badly. It is an uncertain element, and must probably ever perplex all calculation as to the result of the Cæsarian section in any particular case. I do not think that chloroform materially lessens the shock; and it adds the danger of vomiting.

3. The next danger is *hemorrhage*, and as hemorrhage is often associated with prostration as cause and as effect, the danger is serious. This may come on within a few hours. It might be expected that hemorrhage would be liable to come from the inner uterine surface, as after ordinary labour, but the more common source is probably from the sinuses divided in the uterine wound. The quantity lost may be enough to cause a fatal anæmia. But the more common evil is from the irritation caused by the blood collecting in the abdominal cavity giving rise to

4. *Secondary shock* and *peritonitis.*—That secondary shock precedes peri-

tonitis I have no doubt. Intense pain, even tenderness on pressure, rapid small pulse, accelerated and impeded breathing, suggest the diagnosis of peritonitis; but if at this stage the patient die and is examined, probably no trace of peritonitis, as revealed by redness or effusion, is discovered. Peritonitis may come on the day following the operation. It may be met by fomentations to the abdomen, by opiate suppositories; and the prostration soon ensuing must be combated with wine, brandy, beef-tea, chicken-broth. Salines are often useful, especially at first.

5. If the patient escapes the preceding dangers, there is still the risk of septic infection, of *septicæmic puerperal fever*. The source of this is the absorption of septic matter from the cavity of the wound, or from the edges of the wound; or it may arise from general blood-dyscrasia resulting from the accumulation in the circulation of effete matters which the excreting organs are unable to dispose of.

6. In addition to the dangers incident to the operation and to the puerperal state, there is the danger inherent to the disease which rendered the operation necessary, liable in some cases, as in cancer, to be aggravated by the operation, which may accelerate the fatal issue.—*Med. Times and Gazette, Dec.* 26, 1868, *p.* 717.

97.—ON VESICO-VAGINAL FISTULA.

By Dr. Maurice H. Collis, Surgeon to the Meath Hospital and County Dublin Infirmary; Examiner in Surgery to the Royal College of Surgeons in Ireland; Chairman Irish Medical Association.

The first branch of plastic surgery to which I wish to draw attention, is that which deals with fistulæ connected with the vagina and the bladder or rectum. These have been treated by cautery, by suture, and by transplantation of flaps. To the various methods I have contributed one, which has proved not unsuccessful in my hands, and in those of others who have taken pains to master the details. I got the idea from Pancoast, an American surgeon, and author of a work on Operative Surgery. He describes a plan by which he treated a vesico-vaginal fistula successfully. It is briefly as follows. He pares one side of the fistula so as to make it wedge-shaped, stripping it of its mucous membrane, both on vesical and vaginal surfaces.

Fig. 1.

The opposite side or margin of the fistula is split so as to form two flaps, one vesical and the other vaginal; the raw surfaces, when undisturbed, lying in contact. Between these two flaps, the raw wedge-shaped margin on the opposite side of the fistula is pushed and held by sutures. This sort of dovetailing of the flaps seemed to me an ingenious and happy method of increasing the amount of raw surface, and so, of increasing the chances of union.

I had not been long acquainted with this method, when I chanced to meet a case of vesico-vaginal fistula which seemed to me capable of cure. It was the first I had seen; for at this date (1856), they were looked upon in Dublin as incurable. At least, the success was so slight, that men had given up trying any plastic operation for their cure. If a touch of the cautery would close them, well and good; but if the size were too great for that, they were dismissed as incurable.

The method I adopted in my first case has since become known in foreign parts as Collis's method. It is, however, simply a modification and improvement on Pancoast's. I split the margins of the fistula all round to an extent of at least half an inch. This incision of the margins must always pass well through any tough cicatricial tissue, and reach sound areolar tissue. If this point be not attended to with great care, the operation will fail. Having split the margins, I now insert a sufficient number of quilled su-

tures (Fig. 2), and, on tying the loose ends with a moderate degree of tightness, the flaps open up, and a very large amount of raw surface is made available for union.

Fig. 3 shows the position of the quills and margin on the stitched or vaginal aspect.

Fig. 4 is a sectional view, showing not only the position of the parts depicted in the previous figure (3), but also the mode in which the vesical flaps adapt themselves to one another; also, the position of the quills and sutures.

This mode of treatment has succeeded well in my hands, and in those of Dr. Kidd and other friends. The result in my own practice is thirteen cases and nine cures.

The advantages of this method are—1. There is no loss of tissue, as in paring operations. 2. There is a very large amount of raw surface compared to any paring operation. 3. The flaps towards the bladder will often unite, while the vaginal flaps may fail to unite, either from suppuration or ulceration. Even when the vaginal flaps have been allowed to slough off from undue tightening of the sutures, union of the vesical portion has taken place. 4. These flaps act also as valves to prevent the access of urine in the wound.

I would only add that the length of time I leave the sutures uncut depends on the extent and toughness of the flap. It will vary from the third to the sixth day. I keep the bowels quiet with moderate doses of opium. I keep a catheter in the bladder for forty-eight hours: and I generally place a piece of soft sponge in the vagina to support the sutures, just enough to assist in making a moderate pressure on the bladder, and keep it from much movement. I may add, that I have often resorted with success to this method when other methods had failed.—*British Medical Journal, Nov.* 14, 1868, *p.* 518.

96.—ON THE DIFFERENT MODES OF PREPARING THE SPONGE TENT, WITH DIRECTIONS FOR MAKING IT ANTISEPTIC, &c.

By Dr. George Sykd Bryant (late of St. Louis), Lexington, Ky.

[The use of sponge tents in uterine disease is so necessary and frequent, that any suggestions as to their improvement are of value.]

The great objection to the sponge tent has been its retention of the secretions, allowing them to decompose in the uterus, and in some instances producing pyæmia. This absorbing quality of the sponge made it desirable to find a substitute for it as a uterine tent. The sea-tangle—"laminaria

digitata"—was proposed by Dr. Sloan, of Scotland, for this purpose, and greatly improved by Dr. Greenhalgh. But this article is far inferior to the sponge except in the single quality of cleanliness. Some surgeons prefer the sea-tangle when the os is very small, not admitting even the most diminutive sponge tent. The usual plan of treating these very narrow constrictions has been with metallic stilettes, or wooden stems, until the os or canal was sufficiently large to admit a small sized sponge tent. But this slow process of dilatation I have long since abandoned, and am in the habit of resorting at

Fig. 3.

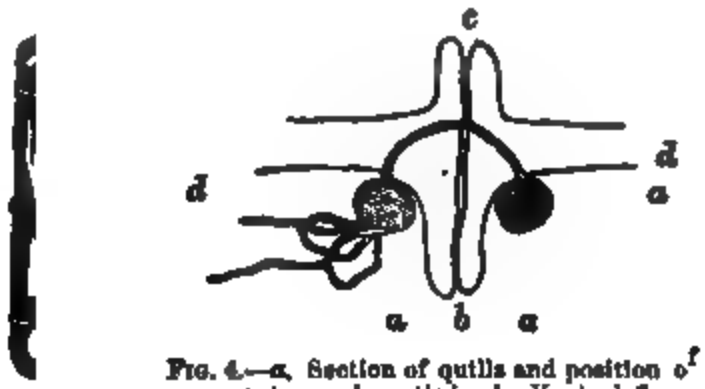


Fig. 4.—*a*, Section of quills and position of suture when tied. *b*, Vaginal flaps. *c*, Vesical flaps. *d*, Vesico-vaginal septum.

once to the knife, opening up the os and cervix sufficiently to receive a small carbolized sponge tent; after which there is no further trouble in effecting dilatation to almost any desirable degree.

For opening the os and cervix I have added another blade, with a probe point, to Dr. Sims' blunt-pointed ball-and-socket knife. With this blade the nicking operation is perfectly safe; for the probe point can only find its way along the canal, and the cutting edge can do no more than follow the probe point, simply nicking the mucous membrane to the extent of the width of the blade, which should not exceed one-eighth of an inch.

If the objection to the sponge as a nidus for putrid secretions can be obviated it is evidently the best material yet known for dilating the os and cervix uteri. In the American Journal of Medical Sciences of July, 1867, will be found a formula for making the sponge tent antiseptic, by Dr. J. C. Nott, now of New York. He prepares the sponge in the usual way, then saturates it with an antiseptic paste, composed of alum, acetate of lead, wheat flour, and gum-water, heated to the boiling point, and wraps it with gold-beater's skin. It is then punctured freely with the point of a small knife-blade.

Mr. Robert Ellis describes (see Amer. Journ. Med. Science, January, 1868, p. 276) a method of carbolizing the sponge tent by passing threads saturated with carbolic acid through the centre of the sponge longitudinally, which is then rolled into shape and covered with cocoa butter, to which is added a little glacial carbolic acid.

For more than eighteen months past I have been in the habit of using ten or twelve grains of crystallized carbolic acid to one ounce of thick gum mucilage, prepared for saturating the sponge tent before being wrapped with cord. This mode of mine for making the sponge tent antiseptic is well known in St. Louis, and to many of the profession in Louisville and elsewhere. The carbolic acid not only renders the sponge antiseptic, but its styptic qualities add much to the efficiency of the sponge in many diseased conditions of the mucous membrane. In preparing the tent moderately coarse, elastic sponge should be selected. Cleanse it well, cut while wet into the exact shape and size preferred; saturate it with gum mucilage, prepared as before described, and wrap it on an awl, with a strong, coarse, well-twisted cord. The tent should be fusiform in shape, and wrapped from the small end, as directed by Dr. Sims, taking care to keep the layers of the cord as they are carried around the sponge with perfect regularity, in close proximity to each other. By leaving the screw threads—not cutting them down with sand paper—the tent can be much more easily introduced; giving it a

turn, as to an ordinary screw, in the act of inserting it. When made in this way the tent does not slip out, as a smooth one is apt to do; and it should not project more than one-eighth or one-fourth of an inch out of the os. The best instrument I have found for introducing the tent is a pair of small, straight forceps, with an attachment to the handles to make fast the blades. The tent, firmly fixed in the forceps, is inserted as above directed, the uterus being held by a volsella or hook. The tent should always be slightly soaped, more particularly at the small extremity, to enable it to pass in with less friction.—*American Journal of Medical Science, Oct.* 1868, *p.* 410.

99.—ON THE THERAPEUTICAL USE OF MEDICATED PESSARIES.

By Dr. Alfred Meadows, Physician to the Hospital for Women and to the General Lying-in Hospital.

[The medicated pessary in common use has for its basis the cocoa butter, and ordinarily weighs about a drachm and a half. The uncertainty of their action, however, has led Dr. Meadows to question the propriety of using any greasy substance as a vehicle for a drug, as such substances tend to shield the drug from the absorptive action of the vaginal wall.]

I have made some pessaries in which the basis is the neutral soft soap of the British Pharmacopœia, made into a proper consistence with white wax, or powdered althæa root. I have also reduced the size one-half, or even less, as the others appear to me to be needlessly large: these made with the althæa are very nice when properly prepared; they are agreeable in use, and have a pleasant emollient action, which is very grateful where an anodyne effect is also required. There is, however, one slight objection to this base, viz., that it is apt to become very hard if kept long and exposed to the air. This is avoided if only half-a-dozen are made at a time for present use. The proportion which is found to answer best is three parts of soft soap to one part of powdered althæa. Where the emollient action is a matter of indifference, the white wax may be used in place of the althæa, in the proportion of three parts of soft soap to one part of white wax. This mass melts gradually, and forms, with the vaginal mucus, a kind of emulsion holding the drug in solution, which is readily absorbed.

With these ingredients I have had much better, more certain and uniform effects than with those made of cocoa butter; I have, therefore, found it necessary to use smaller doses, if I may so call them, of drugs; for instance, with one grain of extract of belladonna I have had more marked effects than with two and even three before. There is, however, one drawback to be noted. In two cases which have come under my notice, the soap appeared to cause some little irritation to the vagina; in one of these the patient was obliged to get up in the night and use cold water freely to allay it. I can only explain this as an idiosyncrasy, just as there are some skins which can never bear soap of any kind. In the case in question, however, I found that the althæa with belladonna was borne very well.

There is one other form of pessary quite recently introduced by Dr. Sansom. It consists of a hollow cone of white wax, containing a watery solution of the ingredient used; the apex of the cone is filled over with cocoa butter, and as this melts much sooner than the wax the liquid flows out, and is then absorbed. I have not yet been able to test these efficiently, but the idea is ingeniously carried out by a chemist at Islington, and may, I conceive, prove successful; the preference which, as yet, I feel disposed to give to those I have employed arises partly from my fear lest the watery solution in these latter forms might escape too quickly for complete absorption, and so the dose become untrustworthy.

A few words now as to the remedies which may be used with most benefit. As anodynes I do not think there is anything comparable with the extract of belladonna in about 1 gr. doses, or its alkaloid, atropine, in $\frac{1}{8}$ gr. I have

long been in the habit of using this, and can endorse all that Dr. Anstie has urged in its favour as a special anodyne to the female pelvic organs. Conium I have also used, and, though it is strongly recommended by French authorities, I have not found any great benefit from it. Henbane is better (5 to 8 grs. of the extract), and morphia (⅛ to ½ gr. of the acetate) is exceedingly valuable. By any of these, used in the way I have suggested, we may easily, if we wish, affect the whole system.—*Practitioner*, *Jan.* 1869, *p.* 12.

100.—ON A NEW DUCK-BILL SPECULUM FOR PRIVATE PRACTICE.

By Dr. J. C. Nott, New York

[This speculum is peculiarly suitable to the requirements of the private practitioner.]

No one who has worked much in uterine surgery, and tested fairly the lever speculum of Sims, and the various forms of valvular and cylindrical specula, can deny that the former possesses important advantages over all others. I believe I may safely say that there is scarcely anything that can be done with others, that cannot be equally well done with the instrument of Sims, while the latter has many applications peculiar to itself.

The leading advantages of Sims' speculum are briefly these: It enables us to explore the vagina more satisfactorily than any other, as it covers but a small portion of the canal, and its position is quickly changed. Where the vagina itself is diseased, or sensitive, it is greatly preferable, as it presses on but one side, and leaves the atmospheric pressure to complete the dilatation. During operations the position and direction of the instrument can be changed by the assistant, at a moment's warning, to suit the wishes of the operator. It obstructs less the view and manipulations than any other speculum heretofore used. Not putting the vagina on the stretch *longitudinally*, it allows the uterus, by slight traction with a tenaculum, to be brought near the vulva, and thereby greatly facilitates cauterizing, probing, and all cutting operations on the cervix, introduction of tents, &c. Nothing need be said about its triumph in vesico-vaginal fistula.

It would be a waste of time to enumerate the objections, now so generally admitted, which may be made against the cylindrical and common valvular specula; suffice it to say that their utility is limited to but few conditions—that they act on principles the reverse of the instrument of Sims—they dilate the vagina simply by mechanical force—they cover the whole vagina from view—they *push the uterus away* from the operator, and are of little service beyond affording an excellent view of the os and lips of the uterus, and of allowing the easy application of caustics or other remedies to these parts. Where flexions or versions of the uterus exist, they do not even admit the introduction of a sound without unjustifiable violence, and from the length and narrowness of the channel through which we hope to manipulate, they are utterly useless in all cutting operations. The ingenious instruments of Drs. Emmet, T. Gaillard Thomas, and Bozeman, have been fully described by their representative inventors, and any fair comments upon their respective and acknowledged merits would far transcend the limits here allowed me. I would remark, in passing, that I do not think either one well suited to the wants of the *private practitioner*. To get at the cervix uteri they all require either the semi-prone position or that on the knees; they consequently require an elevated table, and a light horizontal with the table, to give a good view, all of which conditions are inconvenient in private houses. Dr. Thomas' modification of Sims' speculum requires to be held by one hand, and therefore leaves but one free. Dr. Emmet (whose operations are all performed in hospitals, private or public) frankly said to me that Sims' speculum is superior to all others, and that he rarely uses any other. His object in contriving a new instrument was not for his own convenience, but for that of others; and the profession is certainly

greatly indebted to him for his success. The operation of vesico-vaginal fistula, and most other vaginal operations, can be well performed with his instrument. The instrument of Dr. Bozeman is peculiarly adapted to the operation of fistula as I understand it, and the modifications of Sims' speculum, and that of Cusco by Dr. Thomas, though excellent instruments for most purposes, are wholly inapplicable to the operation of fistula. But there are insuperable objections to the speculum of Sims in *private practice.* It requires, for the simplest manipulations, a table from two and a half to three feet high, and a horizontal light; it requires a trained assistant to manage it; and the patient must be placed in the semi-prone position, with the head lower than the hips, which is very constrained and fatiguing if long continued.

We might just as well attempt to popularize the fracture beds of Jenks or Daniels, as the speculum of Sims; and from its bulk, costliness, and liability to be broken in carrying it about, the instrument of Dr. Emmet, with all its merit, is not, I fear, destined to come into general use.

I may remark by way of parenthesis, that the operation of vesico-vaginal fistula has long since ceased to be one of the wonders of the world. The rules for its execution are so well defined, and the operation now so simple that any one of ordinary dexterity can perform it. In this operation assistants are indispensable, and I do not see that it really requires any more perfect instrument than that of Sims, unless in a few exceptional cases—perhaps in some very fat women. Dr. Emmet, with Sims' speculum and a few simple instruments, performs it two or three times a week; and I have repeatedly seen him do it, as also his operation for procidentia, with the utmost dexterity and dispatch.

Like lithotomy and ovariotomy, these operations are comparatively few, and rarely fall into the hands of any but specialists. *What most practitioners want is a speculum for every-day use*—one which will enable us to explore readily the vagina and uterus—to introduce a sound—to introduce tents—to split or amputate the cervix with scissors, &c., all of which I have been doing for months past with my speculum, and with quite as much and more ease than I could with that of Sims.

In very large fat women, from the disposition of the vagina and bladder to crowd in, in front of the os uteri, my instrument (as that of Sims and all others that I have seen used) meets with difficulty; but these exceptional cases are few and far between. Dr. Bozeman claims to have overcome this difficulty in the operation for fistula, and his experience gives full weight to his assertion.

The following are the advantages I claim for the instrument I introduce to the profession:—

1. No instrument hitherto devised can be more easy to introduce.

2. It can be equally well used in the semi-prone position or on the back.

3. While elevating or depressing the perineum, its feet are so constructed as to expand the *ostium vaginæ* to any desired extent.

4. It is perfectly self-retaining, without any arrangement external to the vagina.

5. In the semi-prone position it has the same advantage of atmospheric pressure as the lever speculum of Sims, and when the patient is on the back, by elevating the hips with a cushion, or pillow, you have the same advantage of atmospheric pressure.

6. I use the instrument almost entirely with the patient on the back, because the position is more comfortable; because I can do everything I wish to do with more facility; and because the light from any window is more easily commanded. The concave surface of the speculum looking upwards, catches and throws the light fully on the anterior wall of the vagina and os uteri.

7. For all ordinary manipulations, where no cutting is required, instead of a table, any common bedstead or couch will command the light sufficiently from almost any window to give a good view. Baker Brown, in his

operations for vesico-vaginal fistula, while using Sims' speculum, places the patient in the lithotomy position.

8. Like Sims' speculum, mine does not stretch the vagina *longitudinally*, and therefore allows the os uteri to be drawn down with a tenaculum nearer to the vulva.

9. The anterior wall of the vagina being left free, more space is afforded for operations.

10. With this speculum there are few operations that cannot be easily performed without an assistant.

I have also added, in some of the instruments, a small tenaculum, two inches long, with a little chain, any link of which may be made to catch on to a knob at the heel of the instrument. With a pair of forceps the tenaculum is fastened into the anterior lip of the uterus, and then drawn out and fixed at any point we desire.

I should remark that I have not yet tried this instrument in a case of vesico-vaginal fistula, and do not think it would answer well in any but small openings. By shortening the feet of the instrument, however, they would be out of the way, and the instrument would still be self-retaining. The feet need only be long enough to curve around the rami of the pubes, and thus not press upon or stretch the bladder; with this alteration I see no reason why it should not answer well for vesico-vaginal fistula.

Directions for using the Speculum.—The depressor being retracted and the instrument closed, the palm of the hand is placed over the outer opening of the instrument; the end of the thumb is placed on the back of the duck-bill, and the index and middle fingers curved over the heels of the feet—The blades are all thus firmly compressed together. Pass the instrument into the vagina *as far as it will go*, the end of the duck-bill gliding along the posterior wall of the vagina, and the curved feet well within the arch of the pubes. Then turn the button on the screw until the perineum is pushed sufficiently out of the way, and the ostium vaginæ is well opened. In women who have had children, the instrument may be slowly expanded nearly or quite to its full limits. Then, if the os uteri is not in view, push the end of depressor forward, and sweep it round to the central line to hold up the wall of vagina, and bring the os uteri in view. This is the only difficult point to the novice, but is easily overcome by a little practice. In some cases, as with Sims' speculum, a small tenaculum hooked in the os uteri, will facilitate the view by bringing the uterus lower and changing its axis.

In fat women the same difficulty exists with this as with all other specula, in probing and in all cutting operations. I have not used this instrument with the patient on the knees, but the principle and action here would be the same as the lever of Sims'; the action of the air would be the same.

Caution.—Nitrate of silver and other chemicals act on plated instruments, and when I apply them to the os uteri, I always stuff a little cotton between the uterus and the instrument to protect it.

The following wood-cuts represent the instrument with the feet upwards, the attitude in which I most frequently use it.

Fig. 1. The instrument as expanded, after being introduced.

Fig. 2. The instrument closed, preparatory to introduction.

If the reader will turn the drawings upside down, he will probably form a better idea of the shape and construction of the instrument. The two feet *b*, *b*, are intended to stand firmly on the rami of the pubes, while by turning the button on the screw, the duck-bill or lever recedes and carries with it the perineum.

Fig. 1. represents the instrument with the feet upwards, as it is used when the patient lies on her back,

a, the duck-bill, corresponds with the Sims' lever, and acts on the perineum in the same way.

b, *b* are the two feet, which rest on the rami of the pubes, and are so shaped as to curve smoothly around the bones, and not to press on their sharp edges.

c, is the depressor (or elevator, according to the position of the patient), which may be pushed forwards or drawn backwards, and swings around from side to side, like an oar on a pivot, so as to press out of the way the anterior wall of the vagina. This is a very convenient appendage when the patient is on the back, but may be dispensed with when the instrument is used in the semi-prone position. It is easily slipped out by unscrewing the little button, *d*, on the end.

I should remark that this depressor is the only part of the instrument that is likely to give the inexperienced operator any trouble. It should not be too much curved and when pushed to its full extent, should stand in a line with the axes of the feet of the instrument. It is malleable, easily bent, and very little practice will enable the operator to shape it properly.

e, is the button which plays up and down the screw, expands or contracts all the blades simultaneously, and fixes them at any point to suit the capacity of the vagina.

f, is the screw which opens or closes the instrument.

Fig. 1.

Fig. 2.

After the operator has secured a good view of the os uteri, should he wish to draw the uterus nearer to the vulva, this is easily effected by catching the anterior lip with a tenaculum, and drawing it down, whilst the depressor is retracted and taken out of the way.—*American Journal of Medical Science, Oct.* 1868, *p.* 420.

101.—ON SOME CASES OF INFLAMMATION OF THE BREAST SIMULATING CANCER.

By Thomas Bryant, Esq., Assistant-Surgeon to Guy's Hospital.

The majority of surgeons of the present day are disposed to believe that an operation for cancer of the breast should be undertaken as soon as the nature of the disease has been clearly decided; for it seems tolerably certain that a woman has a better chance of being cured of the affection, if I may use such a term, or of being rendered free of the disease for a more lengthened period, by an early operation, than by one undertaken when the cancer has existed for many months, or has undergone degenerative changes, when, too often, secondary deposits have taken place in the absorbent glands, or it may be in other parts. The diagnosis of a cancer of the breast in its early stage is consequently a subject of great importance, and the differential diagnosis between it and other affections for which it has been and may be again mistaken becomes a matter of some interest. I propose, therefore, in the following brief communication, to consider the differential diagnosis of cancer of the breast and chronic inflammation of the gland, for it is between these two classes of cases that the greatest diagnostic difficulties are encountered and the gravest errors in practice fallen into; for who has not known a chronic inflammation of the breast-gland mistaken for a cancerous affection, or a chronic abscess of the breast removed for a cancerous tumour? Under these circumstances, the following cases of inflammation and suppuration of the breast appear worthy of record; for in their clinical aspect they displayed symptoms which are not uncommonly found to be connected with cancerous affections—such as a retracted nipple, adhesion, puckering or cupping of the skin to the parts beneath and enlarged axillary absorbent glands. They clearly point out the value and necessity of closely inquiring into the history of a case before making a diagnosis, and the wisdom of not laying too much stress upon the presence or absence of any single symptom. A true scientific diagnosis, resting upon a correct appreciation of the value of symptoms—taken in the order of their appearance and in their different combinations—for a single symptom, uncombined with others, is of small value when considered by itself, although when combined it may be of primary importance; for symptoms can only be interpreted correctly by the aid of others with which they are associated.

Case 1.—*Chronic Abscess in the Breast with a Retracted Nipple.*—Ellen D., aged 39, a married woman, the mother of three children, the last *eight* years since, came under my care at Guy's Hospital, on April 1st, 1867, with a swelling in the left breast of two months' duration, and a retracted nipple. The tumour occupied the axillary half of the mammary gland; it was hard to the hand, and doubtfully elastic; it clearly was an infiltration, of some kind of the gland-tissue. The nipple had become drawn towards the axilla since the swelling first appeared, and the breast was the subject of a sharp pain, there was no external sign of inflammation whatever, and no increase of heat. The axillary glands were, however, uninvolved. A correct diagnosis of the case at this period of the disease was clearly difficult. The age of the woman, the fact that the breast-gland had ceased to be active for eight years, the infiltrating character of the disease, and the retraction of the nipple, were amply sufficient to render the opinion probable that the disease was cancerous; and yet all these symptoms were quite compatible with a simple affection, and as the result proved, were due to such. For in two weeks the skin over the tumour had become involved and glued to the parts beneath. Some slight redness of the integument also appeared. In another week, an abscess was opened, and several ounces of pus escaped. On May 15th, six weeks after her coming under my care, and about four months after the first appearance of her symptoms, she was discharged cured. The nipple, however, remained somewhat retracted.

Case 2.—*Chronic Inflammation of the Breast Simulating Cancer*—Eliza W., aged 34, came under my care at Guy's Hospital, on June 6th, 1867, for an

affection of the right breast of nine months' duration. It had appeared after a blow. The whole gland was involved in the disease, and was much swollen, being clearly infiltrated with inflammatory and other products. The nipple was completely drawn in, and out of sight. The skin also was fixed to the parts beneath, and brawny. Manipulation of the part caused some little pain. The axillary glands were somewhat enlarged and tender. There was no perceptible increase of heat in the part. Judging from the symptoms alone, there might probably have been some little difficulty in forming an opinion in this case, for a gradual enlargement of the breast for nine months, an infiltration of the skin, retracted nipple, and enlarged axillary glands are such symptoms as are constantly found to exist in cancer of the breast. An inquiry into the history of the case, however, put an end to all doubt, for it was elicited that the woman had been confined twenty-one months previously, and had been suckling up to the time when she received the blow. The subsequent course of the case proved the disease to be simply inflammatory; for, under tonic treatment and cooling local applications, all the inflammatory thickening and infiltration gradually disappeared, and in two months she left cured.

Case 3.—*Chronic Abscess in the Centre of the Breast, simulating Cancer in its Local Symptoms.*—Mrs. R., aged 37, a married woman with one child three years old, came under my care at Guy's Hospital on May 13th, 1867, for a swelling in her left breast of six weeks' standing. The tumour was placed in the centre of the mammary gland; it was firm to the feel and indistinctly fluctuating; manipulation caused pain; the skin over the part was healthy and quite mobile. The nipple had retracted during the last three weeks. There were also enlarged axillary glands. The diagnosis of this case was very obscure, for such a combination of symptoms as I have just detailed are seldom present except in cancer. On April 11th, however, one month after her first visit to me, it came out that she was pregnant about three months. The tumour by this time had been much enlarged, and fluctuation had become more distinct. For diagnostic purposes, therefore a grooved needle was introduced into the centre of the growth, and pus escaped. The abscess was accordingly freely opened, and a rapid recovery took place.

Case 4.—*Chronic Abscess in the Breast, simulating Cancer in its External Symptoms.*—L. W., aged 39, a single woman, came under my care on November 22, 1866, for a tumour, of the size of a walnut, above the areola of the left breast. It had existed for many months, and had appeared slowly. It was the seat of a chronic pain. The nipple was completely retracted, and the skin over the tumour was puckered and adherent to the parts beneath. The axillary glands were apparently sound. The symptoms thus tabulated were such as are very commonly found in cancerous disease; and the fact of the patient being a single woman, and about forty years of age, tended to encourage such an idea of the case. An inquiry, however, into the history of the disease cleared up the doubt; for it was discovered that the retraction of the nipple had been a congenital condition, and the puckering and adhesion of the skin to the surface of the tumour were due to the cicatrix of an abscess which had attacked the breast twelve years previously. The tumour in the breast was a chronic abscess, which was subsequently opened, and a good recovery ensued.

Case 5.—*Chronic Inflammation of the Right Breast, simulating Cancer: Recovery: True Cancer of the Left Breast one year later, and death.*—Susan W., aged 48, a married woman with one child 22 years of age, came under my care at Guy's Hospital on November 27th, 1865, for some affection of her *right* breast. It had existed for two months, had come on gradually without any known cause, and was the seat of a dull aching pain which passed down the arm. The skin over the part was also cupped, and slightly adherent to the gland beneath. The axillary glands were quite healthy. To the hand, the swelling was clearly due to an infiltration of the mammary gland. The local symptoms in this case, as in the last, tended to indicate the presence of a cancer; the age of the patient likewise went to support the idea. The history of the patient, however, did away with such an opinion; for it was discovered that

the cupping of the skin was due to the cicatrix of an old abscess which had existed twenty-two years previously. Under tonic treatment this patient rapidly recovered, all induration of the breast disappearing. It is interesting to observe, however, that this patient reappeared one year subsequently with a genuine cancerous disease of the *left* or opposite breast, which went on rapidly to develope and to destroy life.

Case 6.—*Chronic Induration and Suppuration of the Breast simulating Cancer, in a Woman aged* 64.—Hannah N., a married woman, aged 64, came under my care at Guy's Hospital in October, 1859, for some affection of her right breast. It had been coming on for about six weeks, the glands having become gradually hard and painful. When I saw her, the breast was generall much indurated and formed a globular firm swelling; manipulation caused some pain. The nipple was slightly retracted. The axillary glands were free from disease. The skin over the tumour was mobile and healthy. The tumour moved freely upon the parts beneath. The local symptoms, together with the age of the patient, and the total absence of any external signs of injury or history of accident, were enough to excite the idea of the tumour being cancerous; but it was not so; for in about a week pus escaped from the nipple, and, in another, fluctuation was felt deeply seated below the nipple. The abscess was opened, and in about a month a good recovery ensued.

Case 7.—*Chronic Inflammation of the Breast in a Single Woman, simulating Cancer.*—Ellen A., aged 56, a single healthy woman, came under my care at Guy's Hospital, on July 3rd, 1865, for some affection of the left breast. It had been coming on for about three weeks without any known cause; the breast gradually becoming hard and painful. When I saw her, the whole gland was infiltrated with some new product, inflammatory or otherwise. It was indurated and tender on manipulation. There was no enlargement of the axillary glands. The nipple was completely drawn in, and out of sight. The skin over the breast was healthy and the tumour moved freely upon the parts beneath. The case was one of a doubtful kind; the age of the woman and the local symptoms raised a suspicion of its being of a cancerous nature, and yet its progress had been somewhat too rapid for the generality of such cases. On inquiry, also, it was found out that the retracted nipple was a congenital condition. Tonics were given and the case was watched. In a fortnight distinct evidence of inflammation of the skin appeared with indistinct fluctuation. In another week an abscess was opened, and rapid convalescence followed.

Case 8.—*Chronic Abscess in Breast with Retracted Nipple.*—Sarah M., a childless married woman, aged 20, came under my care at Guy's Hospital, on December 30th, 1863, for some enlargement of the left breast. It had been gradually coming on for eight months, after a blow. The swelling was accompanied with a dull pain, and the gradual retraction of the nipple. When I saw her the breast was clearly much enlarged, the whole gland forming a firm semi-elastic tumour; the nipple had completely disappeared. The skin over the tumour was healthy, as were the axillary glands. The gradual enlargement of the breast with retracted nipple might probably have induced a surgeon, who put too much value in such symptoms, to suspect a cancer, although the age of the patient and the history of a blow forbad the entertainment of such an idea. The case turned out to be one of a chronic abscess. It was opened, and a good recovery took place.

Case 9.—*Chronic Inflammation of the Breast simulating Cancer: Recovery.*—Mary R., a married woman aged 41, the mother of nine children, came under my care at Guy's Hospital, on Aug. 25th, 1864, for some affection of her right breast. It had been coming on for about nine months, and was accompanied with pain. The gland had been gradually becoming larger and harder, and the nipple had been slowly retracting. When coming under observation, the breast appeared as a firm globular enlargement and the nipple was quite out of sight. The tumour moved freely upon the parts beneath, and the skin over it was quite free. There was no enlargement of the axillary glands. The age of the woman and the general appearance and condi-

tion of the breast indicated the presence of a cancer; and to those who looked upon the retracted nipple as a definite sign of such a disease, the diagnosis would have been complete. On inquiry however, into the history of the case, it was elicited that the induration of the breast had gradually appeared after her last confinement, in which she lost her child, nine months previously; and that the possibility of the disease being of a chronic inflammatory nature was rendered probable. This view of the case turned out to be the right one; for in the course of one month an abscess appeared which was opened near the nipple, and in three months a recovery was declared. The nipple, however, continued somewhat retracted.

Remarks.—There would be no difficulty in quoting other cases to illustrate more fully the subject of this communication; but I trust I have brought forward sufficient to indicate the quarter in which some of the difficulties of diagnosis are to be found, and the means by which errors of diagnosis are to be avoided. I have pointed out how, in cases of chronic inflammation of the breast-gland, nearly every local symptom found in cancer may be simulated: and how necessary it is for the surgeon to make a careful inquiry into the history of every case, to understand how each symptom is produced, and to weigh the value of every point before giving a diagnosis. I think that I have demonstrated that local symptoms will constantly mislead when taken by themselves, and that they can only be correctly interpreted by the antecedent points connected with their history. In all the examples of disease which I have just brought forward, the surgeon would doubtless have been misled, had he trusted to local symptoms, and had he failed to inquire into the facts touching the history of the cases from an early period; for, in many of the examples, the symptoms which appeared characteristic of cancer turned out fallacious, and were due either to a congenital condition of the parts, or to an old or recent inflammatory affection.

I trust I have also demonstrated, by the quotation of cases, the value of an exploratory puncture with a needle into the centre of certain cases of tumour, when the nature of the disease is doubtful. In cancerous cases, the puncture will do no harm; in inflammatory cases, it will dispel the doubt. It will often turn doubt into certainty, and save errors of diagnosis, as well as of practice.

By way of conclusion, I will observe that *cancers* generally attack the breasts of women during the functional decline of the mammary gland, that is after 40 years of age, and *inflammatory* affections during the period of its functional activity; that nearly every local symptom of cancer may be simulated by chronic inflammation of the breast; and that the careful consideration of the history of the case will alone enable us to escape error. In all cases of disease of the breast, let it be therefore our rule to inquire into the history of the case, and the gradual development of the symptoms, before giving a diagnosis; and, in certain doubtful cases, let it be our practice to explore the tumour by means of a needle before giving an opinion, and certainly before we act upon it.

By adopting, or rather acting upon, these suggestions, we shall often be saved from serious errors; we shall render our practice more certain, and consequently more successful.—*British Med. Journal*, *Dec.* 12, 1868, *p.* 601.

ADDENDA.

102.—AN IMPROVED SYRINGE-PIPE FOR HYPODERMIC INJECTION.

By Dr. Thomas Buzzard, Assistant-Physician to the National Hospital for the Epileptic and Paralysed.

Those of us who are most favourably disposed towards the hypodermic injection of drugs are yet obliged to allow that our patients not unfrequently object very strongly to the pain occasioned by the introduction of the syringe-tube. And we sometimes find it as hard to convince such persons that they are not being hurt as the shoemaker did to prove to Lord Foppington that his shoe was not too tight. "Your lordship," he said, "may please to feel what you think fit; but that shoe does not hurt you. I think I understand my trade!" A syringe-tube which I have lately had made will, I hope, do something to extend the hypodermic method by the facility and the comparative painlessness of its introduction. The ordinary syringe-tube, it will be remembered, is of gold or silver gilt, and is tubular to the very end, which is sharpened as well as the somewhat soft material allows. Steel tubes of the same form are sometimes employed, but they quickly corrode and get choked. It occurred to me that it was quite unnecessary for the syringe-pipe to be tubular *throughout*, and that a gold tube might with advantage be fitted with a *solid* steel spear-point of the best form for penetrating the skin. At my request, Messrs. Meyer and Meltzer, of Great Portland-street, have attached a triangular steel prism to the ordinary gold tube, and thus constructed an instrument which pierces the skin as easily as the "glover's" needle, which is preferred to all others, by many surgeons, and which the termination of the tube closely resembles. The advantages of incorrodibility in its tubular portion, and sharpness of point are thus combined. The point is wiped by simply passing it between the thumb and finger.—*Lancet*, *March* 20, 1869, *p.* 397.

103.—HYPODERMIC MEDICATION IN GOITRE.

Prof. A. Lucke, of Berne, reports in the Berlinea Klin. Wochenschrift, No. 25, 1868, a very interesting case of this disease cured by the subcutaneous injection of tinct. iodinii fort. (1:8). He made the injections at several spots, and at intervals of eight days. He began with four to five drops, and at last got up to two Paraz's syringes full. Until the larger quantities were used, no local or general reaction followed; and only then could iodine be detected in the urine. After four months' treatment, the patient was so far improved that only a few very hard small knots could be felt where the tumours had been.

In the October number for 1867 of the Archives Générales, Dr. A. Luton de Oviens publishes the results of a similar treatment; he gives the account of eight cases which were more or less perfectly cured; in one case suppuration occurred.

Luton and Lücke mention two successful cases in which the same treatment

was applied for the cure of chronic enlargement of the lymphatic glands.—*Medical Press and Circular, Jan.* 20, 1869, *p.* 63.

104.—THE SUBCUTANEOUS INJECTION OF ATROPINE.

A country practitioner sends the subjoined note:—

"The following facts, in connexion with the subcutaneous injection of the sulphate of atropia, may be interesting to some of the readers of the Practitioner. Shortly after the practice was introduced, I commenced it with a patient, and for the last eight years have daily used it for the same person. I dissolve three grains in half an ounce of distilled water, and this suffices for exactly fourteen injections. The toxic effects of the drug are confined to a dryness in the throat, a difficulty of swallowing for four or five hours after, if attempted, and dilatation of the pupils; nearly always, however, sleep follows in a few minutes. There is no waste of the atropia solution, except what must adhere to the inside of the barrel of the syringe. Owing to the danger said to exist (in books and periodicals) in giving the atropia, except in very small doses to commence with, I have only used it (and that once) in two other cases—doses the same as in the first instance: Acute lumbago; pain removed in half an hour; toxic effects well developed; quite cured. Subacute lumbago of some three months' duration—toxic effects very slight; remedial the same."—*Practitioner, Feb.* 1869, *p.* 126.

105.—ON DISINFECTION WITH CARBOLIC ACID VAPOUR.

By Dr. James B. Russell, Physician to the City of Glasgow Fever Hospital.

[Any agent employed to purify the air in such a place as a fever or cholera hospital, or sick-room in a private house, where the case is one of an infectious nature, should be one which is respirable without injury or irritation to the lungs. Chlorine and sulphurous acid gas are inapplicable as being both very obnoxious. It occurred to Dr. Russell to try carbolic acid, and the method he employed is thus alluded to in the "Report on Cholera Hospitals," incorporated in the "Report of the City of Glasgow Fever Hospital for 1866-7."]

"Having observed how readily carbolic acid distributed itself through the atmosphere of a room along with steam, I placed in each ward a gas evaporating stand, by means of which the steam of a solution of the acid and water was constantly thrown off." (p. 35.) The arrangement thus alluded to was simply a stand, supporting a small tin vessel containing carbolic acid and water, having beneath a Bunsen's burner supplied with gas by a flexible tube. This stood on the table in the centre of the ward; and the nurse was instructed to supply water when required, and acid so that a little might always be seen still undissolved. In the temporary hospital at Greendyke, American stoves were used for heating, and the vessel was simply placed in the round aperture provided on the top of each. By this means the moisture so necessary where such stoves are employed was also supplied to the atmosphere. The device thus adopted for cholera hospitals was continued in the City of Glasgow Hospital when it reverted to its original use—the treatment of fever. As perceived by the sense of smell, the effect was a mild odour of carbolic acid in all parts of the wards. What benefit accrued to the patients and attendants can hardly be estimated. That the agent was present to a degree sufficient to be obnoxious to animal life was shown by the circumstance that, during the hot summer of 1868, the flies, which were so numerous and annoying in wards not so fumigate , were only occasionally seen in wards furnished with the evaporating apparatus. Flowers placed on the window-sills were not affected, but pendant plants hung from the joists immediately over the table referred to above soon died.

Recently I improved the arrangement by adopting porcelain instead of tin basins, which were soon perforated by the action of the gas-jet externally and the acid internally. I also added a small flat porcelain cup, containing the pure acid, so as to combine with the evaporation of the aqueous solution the evaporating influence of a water-bath. The result has been very greatly to increase the amount of the disinfectant circulating in the atmosphere. It is strongly perceptible in every part of a ward 48 feet long by 20 wide.

As to the practical benefit of this process, I have already stated that I am unable to say this or that has been the result. In the first place, this much may safely be asserted, that no harm can be done. The odour is aromatic and agreeable to most persons, though not to all. Some find it repugnant. It is in this direction we must look for the benefit—in the cleansing of the air for the use of attendants and patients, not in the "cutting short" of disease in individual cases. By this, and disinfecting powders in the night-stools, with good ventilation, it may be made quite certain that the poisonous effluvia of one patient will not reach another. Dr. Lemaire proves by every variety of experiment that water containing a *hundredth* of the acid is sufficient to destroy all the small noxious animals, and that a *thousandth* will arrest and prevent putrid fermentation" (p. 208). In particular he shows that the *mere vapour* of a few drops of the pure acid at the bottom of "a large jar in direct communication with the atmospheric air" will soon cause the mould on a piece of putrid flesh exposed to the air in the jar "to droop and wither" (p. 59). Although fully alive to the importance of the use, in hospitals, of an agent so inimical to the lower forms of life, Dr. Lemaire does not suggest any method of constantly supplying it to their atmosphere. The simple plan described in this short notice effects this thoroughly. I am induced to make a memorandum of it, because, there being no doubt of the efficiency of carbolic acid as a disinfectant, an *easy* method of disseminating it is alone requisite to ensure its more frequent use in circumstances which so often occur, in which not one isolated act of disinfection is required, but a continuous process. Such circumstances are found in hospitals, we may say in all hospitals, but especially those in which lesions of surface exist, such as surgical and lying-in hospitals; and those in which infectious diseases are treated, such as fever, small-pox, &c. In those institutions a permanent apparatus ought to be contrived. Private practitioners also frequently require this perpetual atmospheric disinfection. Fumes from chloride of lime or open vessels of carbolic acid are not very efficient; and the evolution of chlorine or sulphurous acid is both difficult to control and very disagreeable, and in the better class of houses also detrimental to metal surfaces. It would, on the other hand, always be easy to devise some modification of the water-bath method of distributing carbolic acid. A porcelain cup placed on the round aperture of the globe above the gas jet, having afloat in it another much smaller cup containing pure acid, or a large basin of boiling water renewed from time to time, and bearing a common saucer full of pure acid on its surface, suggest themselves as two out of several plans which might be adopted. My friend Dr. Wood Smith lately used a common retort stand and evaporating dish, with flexible tube and gas jet, during the progress of a virulent case of diphtheria in private. I am not aware that this idea has been systematically carried out in any hospital but that which I attend. It has been partially tried in the Town's Hospital, and in the fever-house, Royal Infirmary.—*Glasgow Med. Journal, Feb.* 1869, *p.* 210.

106.—NEW VAPORIZER FOR CARBOLIC ACID.

Messrs. Salt, of Birmingham, have constructed a very ingenious and well-designed apparatus for the vaporization of carbolic acid. It consists of a receptacle for the acid, covered by a finely-perforated lid. Beneath the receptacle is an air chamber, and beneath this chamber is a recess for a spirit-lamp. Two or three tablespoonfuls or more of carbolic acid (if in the liquid

form), or a portion of the crystals, having been placed in the proper receptacle, the lamp is lighted, and in few moments the acid begins to evaporate, and the vapour is diffused into the atmosphere of the apartment through the perforated plate. The apparatus (as we have tested) is an excellent addition to the sick-room when it is found desirable to use carbolic acid as a disinfecting agent. It can be manipulated so as to keep the atmosphere charged with a distinct and not unpleasant odour of the acid, and will be found particularly handy and useful in private houses.—*Lancet, Feb.* 20, 1869, *p.* 262.

107.—ON A METHOD OF CONVERTING THE SKIN INTO LEATHER.

By John Martin, Esq., Undergraduate in Medicine, Queen's University, Cork.

It becomes sometimes advisable in surgical practice to render parts of the surface of the body tense, and firmly pressed on to the subjacent tissues. This pressure is generally effected by bandages, strips of plaster tightly applied, direct pressure by weights, &c. But it does not appear that surgeons have hitherto adopted a more convenient and effectual method of applying pressure, when such is required, more uniform than great; namely, that of converting the cuticle into a temporary bandage. This may be done by forming a tannate of gelatine in the skin. Ordinary solutions of tannine applied to living tissues act astringently, by causing contraction of blood-vessels, as is seen by the paleness produced in mucous membrane by such application. A very strong, or a saturated solution of this substance, however, applied to the external surface of the body, combines chemically with the gelatine of the skin, before reaching the vessels, forming a contracted impermeable layer of tannate of gelatine; it, in short, tans, or converts into leather, the superficial layer of the cuticle.

The practical application of this fact is sometimes useful, as in the affections presently to be referred to. These may be classed in five divisions, according to the *modus operandi* of the remedy. They are those in which its curative effects depend on (*a*) the *insensibility*; (*b*) *contraction*; (*c*) *impermeability*; (*d*) *contraction* and *impermeability* combined; (*e*) *removal of part*, of the skin, which are caused by its application. As examples of these effects may be mentioned, (*a*) the relief of pain caused by external pressure on tender parts, as the integument covering abnormal projections of bone (as the spinous process of a prominent vertebra, in Pott's curvature, for example), where there exists no corresponding natural thickening of the skin, or in bunions, relieving the abnormal sensibility of the part; likewise the prevention of bedsores of any kind, if applied at the commencement before the skin breaks. (*b*) The binding down of the subjacent parts by contraction and slight pressure, as for example, in weakening of the abdominal wall, and protrusion of the internal oblique muscle, by a long split in the external oblique, in the direction of its fibres (an occasional effect of falls from scaffolding, &c.), too extensive for the truss; reducing an enlarged testicle, by first drawing the integument tense, and retaining it by means of a strap of plaster encircling tightly the cord, immediately above the gland, and applying the solution. (*c*) By its impermeability it checks and prevents unhealthy local sweatings. (*d*) By its early application it causes the absorption of matter deposited in the tissues, which may otherwise point at the surface. Its action, last mentioned in the above enumeration, (*e*) renders it useful in the treatment of cutaneous affections which depend on a local cause, as the layer which it forms peels off after a short time, removing, when they exist, such parasites as the *pediculus pulex penetrans*, *acarus scabiei*, *entozoon folliculorum*, *&c.* The strength of the solution of tannine required for the purposes mentioned is about 600 grains to an ounce of water. It may be applied, according to circumstances, by a layer of lint or wadding, saturated with the solution, or by means of a brush.

There are three points which must be attended to in using this remedy. *Cold water must be employed*, otherwise a solution of pyrogallic acid is used, not of tannine. *The solution must be quite recent*, and prepared in small

quantities at a time; and the *tannine employed must be perfectly fresh*, for, unfortunately, tannine remains but a short time exposed to the atmosphere without being converted into gallic acid. It will be remembered that gallic and pyrogallic acids do not form *insoluble* compounds with gelatine.—*British Medical Journal, March* 20, 1869, *p.* 258.

108.—THE ADVANTAGE OF ADMINISTERING COLOCYNTH IN THE FORM OF TINCTURE.

By Dr. R. W. Creighton, Leamington.

The value of colocynth in cases of habitual constipation, and likewise as a revulsant in head-affection, has been long understood; but seems to have been not quite sufficiently appreciated in this country, from the drug having generally been used in the crude state.

The tincture, as employed in Prussia and admitted into the national Pharmacopœia, is a much more agreeable and convenient method of using it; the small dose required—ten to twenty minims—being easily combined in the same mixture with tincture of hyoscyamus, bromide of potassium, or other medicinal agents. Next to croton-oil, it seems to have the greatest effect among purgatives in diminishing hyperæmia within the cranium; and, in cases of threatened or actual cerebral hemorrhage, its administration with tincture of hyoscyamus and bromide of potassium, I have frequently seen attended with the best results. In habitual constipation, ten, or even five, minims in a little water an hour before breakfast generally suffice to insure a full evacuation, without much inconvenience, or the dose requiring to be increased.—*British Med. Journal, Nov.* 28, 1868, *p.* 572.

109.—ON THE THERAPEUTICAL VALUE OF PEROXIDE OF HYDROGEN.

By Dr. Benjamin W. Richardson, F.R.S.

[The following paper gives a fair resumé of what is known respecting peroxide of hydrogen—its history, preparation, and therapeutical value. Peroxide of hydrogen was discovered by Baron Thénard in 1818, and he gave it the name of deutoxide of hydrogen. Since his time its nature and properties have been investigated by various chemists.]

Of late days the speculations of Schönbein relative to ozone, have caused the peroxide to be discussed more than formerly, in the way of speculative chemical philosophy.

The Preparation of the Peroxide of Hydrogen.—The chemical proposition for the formation of the peroxide of hydrogen was given by Thénard, and it stands unaltered. Gmelin thus condenses it:—

When peroxide of potassium, sodium, barium, strontium, or calcium is digested in any hydrated acid which forms a soluble salt with the salifiable base resulting from the decomposition of the peroxide, the excess of hydrogen does not escape as gas, but passes over to a portion of the water, and converts it into *peroxide of hydrogen*.

To carry out the manufacture it is therefore necessary to obtain one of the above-named peroxides in the pure state. It has been up to this time most practicable to select out of the list the peroxide of barium, a specimen of which I hand round. This peroxide is made either by placing pure anhydrous baryta—obtained from the decomposition of the nitrate by heat—in a glass or porcelain tube, heating to redness and passing through the tube a current of dry oxygen; or by heating together in a platinum crucible anhydrous baryta and chlorate of potassa. The first of these processes is the readiest and, I think, best. The baryta used must be freed, as far as possible, from foreign matter, particularly from manganese, and the oxygen gas

must be entirely freed of admixture with carbonic acid. If either of these substances be present in making the peroxide, the result will be altogether a failure, inasmuch as both these substances have the property of evolving the oxygen with which the hydrogen is to be afterwards charged as fast as the oxygen itself is produced. The proofs that peroxide of barium is pure are these :—It should present a greyish-white surface, free from green specks. Powdered and slaked with water, it should form a paste without evolution of heat. It should be entirely soluble in diluted hydrochloric acid.

In making the peroxide of hydrogen, the further processes are carried out as follows :—We take, say, twenty fluid ounces of distilled water, and add two fluid drachms and twenty minims of pure hydrochloric acid. We make the acid mix thoroughly with the water. Then we take two drachms and ten grains of the peroxide of barium, reduce it to powder, place it in a porcelain or glass basin, and pour on it a little water, until it is made into a soft paste. With a glass or boxwood knife (an iron spatula must not be used), we gently add the paste to the acid s lution, stirring until all is dissolved ; if a precipitate occurs, a minim or two of hydrochloric acid must be added to take up such precipitate. In this step of the process we transform the baryta into the soluble chloride of barium, and at the same time charge the water with one volume of peroxide of hydrogen. The salt of barium, which is soluble, and is in the solution, must next be removed. This is done by adding very cautiously one drachm and a half of dilute sulphuric acid. (The acid must be diluted to one part in three of water.) The sulphuric acid must be added slowly, so that heat be not evolved. The baryta will in this way be all precipitated in the form of insoluble sulphate. The solution at this stage must be set aside for a while to allow the whole of the sulphate of baryta to subside. The clear solution must be poured off as a succeeding step, and filtered through Swedish filter-paper. We have now a solution containing its own volume of peroxide of hydrogen, as before, and again the portion of freed hydrochloric acid in lieu of chloride of barium. To this solution we re-add peroxide of barium, afterwards sulphuric acid, and so on by repetition until the water is charged with oxygen to the amount required by the operator. By care and in time water may thus be charged with thirty volumes of oxygen.

If it be required to obtain the peroxide of hydrogen in a free state by the removal of the hydrochloric acid, we pursue the steps of the process thus :—

To the solution charged with the peroxide of hydrogen and the hydrochloric acid we add carefully sulphate of silver. Chloride of silver is thrown down, and the sulphate is added until the precipitation ceases. The chloride of silver is then separated by filtration. The solution obtained consists of peroxide of hydrogen, water, and free sulphuric acid. The last step is to add baryta to the solution until all the sulphuric acid is fixed as a sulphate of baryta; this is removed by deposition and filtration, and pure peroxide of hydrogen remains in the water.

If it be the wish of the chemist to obtain the peroxide of hydrogen in a concentrate form, he charges a smaller portion of water, by the steps I have given above, with thirty volumes of oxygen. Then he places the solution he has made under the receiver of an air-pump with sulphuric acid around to absorb water. In this condition water uncharged with free oxygen first passes off, and at last a fluid is left which may be considered as absolute peroxide of hydrogen. It yields 475 volumes of oxygen, and evaporates under the air-pump altogether.

Simple methods of making peroxide of hydrogen have been proposed. Pelouze suggested the manufacture by adding the peroxide of barium to a solution of hydrated hydrofluoric acid. Fluoride of barium is thus thrown down, and peroxide of hydrogen is produced in solution. Taking it all in all, I consider Thénard's original process to be the best.

Therapeutical Uses of Peroxide of Hydrogen.—My first object in introducing peroxide of hydrogen into medicine was to test it as a remedy for diabetes. The theory that diabetes was a disease attended with a deficient oxidation, was at

one time extremely popular. I thought it, therefore, fair to ascertain whether a remedy rich in oxygen would be of service in marked cases of this disease. I soon afterwards began to test the medicine in other forms of disease, not on any particular theory of its action in every case, but if I may so say, empirically, in cases where severe and long-continued symptoms were not amenable to ordinary plans of treatment; thus in time—extending now over ten years—I have got together a large collection of facts respecting the effects of the substance in different disorders, which I will epitomise under distinct heads.

Diabetes.—I have tried the remedy now fairly in eleven cases, and in three so rigorously that nothing, I think, remained undone to make the experience crucial.

In the first of these three cases the administration of the remedy was attended with such remarkable signs of improvement that the patient (a woman) came to the conclusion that she was cured. During the first eight days the renal secretion was reduced from five to two pints, and on the eighth day the specific gravity which had been 1045, had come down to 1023. The medicine was now suspended for four days, with immediate increase of the amount of secretion to five pints. The medicine again resumed, there was immediately a cessation of the diuresis. This continued until the eleventh day, on which day only two pints of urine were passed in the twenty-four hours. At this point symptoms of hemiplegia, which had twice before appeared, recurred, attended, as they had also been previously, with epileptiform convulsions, in the course of one of which attacks she suddenly expired. The results of this case left me in doubt as to the influence which the medicine might have had in arresting the saccharine secretions; for it has been observed by Dr. Garrod and other physicians that the elimination of sugar during diabetes is often temporarily arrested by the occurrence of new changes of disease in the system. I held the matter, therefore, open as subject to further inquiry. The quantity of solution taken by this patient averaged three fluid drachms a day; the strength of the solution was ten volumes.

The second case was that of a child 8 years of age. She had been suffering from diabetes for eight months at the time when she was presented to me. At this period the specific gravity of the urine was 1058, and the quantity passed fifty ounces per day. On October 22, she commenced to take the peroxide in drachm doses three times daily, which were to be increased to doses of three drachms; the quantity of urine passed was accurately measured, and the specific gravity taken twice daily. At the end of seven days the specific gravity stood at 1043, and the quantity passed was sixty ounces per day. The treatment was now continued for twenty-three days, the dose of peroxide being increased to half an ounce, when observations were taken for four days with the following results. On the first day the quantity of urine was seventy-seven ounces, specific gravity 1046; on the second sixty ounces, specific gravity 1041; on the third seventy-three ounces, specific gravity 1046; and on the fourth seventy-three ounces, specific gravity 1040

For a period of four days the peroxide was withdrawn, during which time seventy-six ounces were passed daily, with a fluctuating specific gravity; the medicine was then resumed, five minims of the tincture of muriate of iron being added to each dose, and this was continued for seven days. During this period the quantity of urine varied from seventy-five to ninety-one ounces and from this point until the time of her death, two months later, the results were in the main the same, the peroxide having been for several weeks withdrawn, and various other kinds of treatment, such as opium, gallic acid, and cod-liver oil having been instituted in the place of it. Throughout, the greatest attention was paid to the dietary. The ultimate and fatal ending of the case was somewhat sudden, and probably arose from cerebral complication. If any inference is derivable from this case, it is to the effect that, during the time the peroxide was being administered, there was a decrease in the specific gravity, with increase in quantity. I have known the same to occur under other forms of treatment.

The third case of diabetes occurred in a man, by trade a plasterer. It was

obviously connected with cerebral disturbance, as the patient suffered from frequent attacks of vertigo. The quantity of urine passed often exceeded eighty ounces per day, and the specific gravity averaged 1040. He took peroxide of hydrogen for five weeks, in doses of three drachms, three times daily. The symptoms for the first few days were materially relieved; after a time they returned to their original intensity, and the end of the fifth week the man was in the same condition as at the beginning. This man being an infirmary patient left the institution with which I was connected, and I have been unable to follow out the history of his case further.

In two cases of diabetes with phthisis which came to me very late in the progress of the disorders, and were, in truth, fatally disabled by the pulmonary disorganisation, I treated one for three, the other for four weeks, with the solution in doses of three drachms three times daily. In both it seemed that the medicine increased the quantity of urine while it decreased the quantity of sugar. They both ended fatally, the phthisical symptoms being the cause of death. From these experiences, and six others similar, I am obliged with regret candidly to state that at this moment there is no good proof that peroxide of hydrogen is of specific value in the treatment of diabetes.

Struma.—Two cases of struma were treated. They were well-marked instances of the disorder: one in a child, the other in an adult. In both there was a great enlargement of the cervical glands without suppuration. In one case iodine had been applied externally for many months without any improvement. I did not withdraw the iodine, but ordered the peroxide solution in addition. The case rapidly recovered; but as iodine was a conjoint remedy, it would be unfair to give the credit to the oxygen.

The second case had the advantage of being free from the above objection. In it no previous treatment had been pursued, and the peroxide alone was administered. To my surprise the glandular swellings gradually disappeared precisely as under the influence of iodine itself.

I had another case of struma with purulent deposit. A boy intensely anæmic was brought to me in the summer of 1863 with suppurating glands in the neck, and purulent discharge from chronic abscesses in six other parts of the body. He was placed on the peroxide solution, with five minim doses of tincture of the muriate of iron. He bore the solution well, and continued it for many months. He so far recovered that his friends thought it unnecessary to continue their visits, and during the autumn he enjoyed very good health. In the beginning of the following year the symptoms returned, despite the most careful attention to diet and regimen, and he was brought to me again with three enormous abscesses, one of which I was compelled to lay open. He took the peroxide this time without iron, and made a slow but good recovery.—*Med. Times and Gazette, Dec.* 12, 1868, *p.* 661.

110.—ON THE THERAPEUTIC ACTION OF ACONITE AND ITS PREPARATIONS.

By Dr. Sydney Ringer, Prof. of Therapeutics at University College, and Physician to University College Hospital.

Of all the drugs we possess there are certainly none more valuable than aconite. Its virtues by most persons are only beginning to be appreciated, but it is not difficult to foresee that in a short time it will be most extensively employed in the diseases immediately to be noticed.

As external applications, the liniment or ointment is used to relieve pain. They appear to possess power over pain of different kinds. In the neuralgias of the brow or face these applications are sometimes of the greatest use, and often relieve, either permanently or temporarily, the distressing pain of these complaints. But while in many instances their effects are immediate and permanent, yet it must be confessed that in the majority of cases the pain is unaffected. Neither can we, with our present knowledge, predict with any certainty the cases in which the application will be useful, or those in which

it will fail. This much, however, is ascertained, that those neuralgias which depend on decayed teeth or diseased bone, or on tumours pressing on the nerves, are beyond the control of aconite. But these are not the only forms of neuralgia over which aconite cannot prevail. No doubt in some instances the failure can be explained by the badness of the preparation; but even when this is excellent, it is not uncommon for the pain to remain unabated after the application. As, however, no harm can possibly follow their employment, they should always be tried; and if unsuccessful, then resource can be had to other modes of treatment. If aconite succeeds at all, it will succeed at once; and hence, if no relief is speedily obtained, it is useless to continue its employment. The preparation should be sufficiently strong to produce decided numbness and tingling in the skin over which it is rubbed; and, where of service, these sensations replace the pain, which does not return when the effects of the aconite have worn off.

The ointment and liniment should be applied with friction, which very greatly heightens their activity. Of the ointment, a piece the size of a pea or bean should be rubbed into the skin till it has disappeared. Care should be taken while using these powerful and poisonous applications that they are not rubbed into wounds or cracks of the skin, nor brought into contact with absorbent tissues, such as mucuous membranes and the conjunctiva of the eye. Spinal irritation and intercostal neuralgia may in many instances be removed by aconite ointment, and sciatica sometimes yields to the same remedy. The former complaints are better treated by the belladonna preparations.

When employed internally, the following sensations are experienced, the graver appearances and symptoms occurring only when a considerable dose has been taken. There is first a feeling of warmth at the pit of the stomach, with sometimes nausea and vomiting. The feeling of warmth spreads over the body, and there is soon perceived tingling of the lips and tongue and adjoining parts; the uvula with the tongue feels as if it were swollen, and too large for the mouth, and deglutition is frequent. If the dose has been a large one, the tingling and numbness are felt in the tips of the fingers, and thence spread over the whole body, and are accompanied by diminished sensibility and some muscular weakness, which, if the dose is a considerable one, becomes extreme, and is one of the most prominent and important symptoms of the drug.

On the circulation and organs of respiration its action is most noteworthy. With moderate doses the number of the heart's beats are much lessened, and may sink to 40 or 36 in the minute. After a larger and dangerous dose, the pulse rises in frequency, and may become irregular. With some persons such irregularity follows even a small quantity of the medicine. Whether the frequency be increased or lessened, the pulse always loses strength, and hence the circulation is retarded. The effects on respiration are very similar. By moderate doses the breathing grows slower; but after large and poisonous quantities it is often short and hurried.

During the administration of aconite cutting pains are often complained of in the joints and other parts of the body, and there sometimes breaks out on the skin an eruption of itching vesicles. Delirium occurs in some cases, but often after fatal doses the mind remains clear to the last. In some cases which have ended in death there has been found blindness, and deafness, with loss of speech.

When death is produced by this drug, the muscular weakness is extreme, and frequent faintings occur. Death from aconite appears to be due to syncope. On account of its power to diminish sensibility, aconite has been used internally in various painful diseases; but other remedies have, for the most part, superseded it for the relief of pain.

It is on account of its power to control inflammation and subdue the accompanying fever that aconite is to be most esteemed. The power of this drug over inflammation is little less than marvellous. It can sometimes at once cut short the inflammation. It does not remove the products of inflammation when these are formed, but by controlling the disease, it prevents the

formation of these, and so saves the tissues from further injury. It is, therefore, in the early stage of inflammation that the good effects of this plant are most conspicuous; still, although the disease may have progressed to some extent, and have injured the organs by the formation of new and diseased products, while the inflammation is extending aconite does good. It is useful wherever there is acute inflammation of any tissues of the body. The good it accomplishes can be shown both by the amelioration of the symptoms, and, still better, by the changes it effects in the inflamed tissues when these are visible, as in pharyngitis, tonsillitis, &c.

As might be expected, the results of aconite are most apparent when the inflammation is not extensive, or not very severe, as in the catarrh of children, or in tonsillitis, or in acute sore-throat. In these comparatively mild diseases, especially if the aconite be given in the earliest stage of the inflammation, when the chill is still on the patient, the following consequences will very generally be witnessed:—In a few hours the skin, which before was dry, hot, and burning, becomes comfortably moist; and in a little time longer, it is bathed in a profuse perspiration, which may be so great that drops of sweat run down the face and chest. With this appearance of sweat many of the distressing sensations—such as the restlessness, chilliness, or heat and dryness of the skin—are removed. At the same time the quickened pulse is much reduced in frequency, and in a period of twenty-four to forty-eight hours, it and the temperature have reached their natural state. It is rare that a quinsy or acute sore-throat, if caught at the commencement, cannot be disposed of in twenty-four to forty-eight hours. The sweating may continue for a few days after the decline of the fever on slight provocations; but it then ceases.

The appearance of the inflamed part also exhibits, in a striking degree, the beneficial effects of the drug. Thus large livid, red, glazed, and dry tonsils may often in twenty-four hours have their appearance completely altered. If the medicine has been given before much lymph has been formed in these organs, in the time named the swelling and most of the redness will have disappeared, and the mucous membrane will have that look which proves the acute inflammation to have subsided—namely, it has become moist, and is bathed with mucus or pus. If just at this stage some strong astringent—such as glycerine of tannin—be applied, most of the remaining diseased appearance and the pain, if it continues, will be removed. Such are the visible effects of aconite on inflamed tonsils, &c.

These statements are not exaggerations; but the simple truth, as may be witnessed by those who will employ the aconite in the way to be immediately mentioned.

Its effects on catarrhal croup are as conspicuous. In a few hours the urgent dyspnœa is removed; and in a short time longer the fever is subdued. Severe colds, in which there is much chilliness with great aching of the limbs, with a hot, dry skin, and quick pulse, may be equally well treated by aconite. So, indeed, may all the slighter forms of inflammation.

The effects of this valuable drug, though not so rapid, are equally important on pneumonia, pleurisy, and the graver inflammations. These diseases may be considerably curtailed, and made much milder, if aconite is employed.

Its influence on inflammation has been ascribed by most observers to its power over the heart; and, as they truly point out, the remedy is found to be of most use in the sthenic forms of the disease; and where there is great weakness and the heart beats feebly, unless care is taken, it may do harm. The method of employing the drug has much to do with its success. As already said, it should, where possible, be given at the very beginning of the disease. Every hour is of importance; the use of the medicine should never be delayed. Of the tincture, half a drop, or a drop in a teaspoonful of water, should be given every ten minutes or quarter of an hour for two hours, and afterwards be continued every hour. If there be much prostration, and the pulse be feeble and weak, a still smaller dose will best be given.

It is not inappropriate to mention here what signal service the thermome-

ter may render in enabling us to decide whether aconite should be given or not. When called to see a patient, and when the symptoms and physical signs are not sufficiently developed to decide whether an acute inflammation of some deep-seated part has set in or not, this instrument will often decide the doubt. No acute inflammation can exist without preternatural heat of the body. Hence, if in a doubtful case the temperature, after a careful investigation, be found natural, the case is not one for aconite; while, on the other hand, if the symptoms, although doubtful, indicate an inflammation, the presence of an increased heat of the body will very considerably add to the probability of its existence, and will so indicate the advisability of employing aconite.

Another instance may be mentioned. After scarlet fever, as is well known, acute inflammation of the kidneys is very liable to occur. This would at once be indicated by a rise in the temperature of the body. It is therefore desirable to direct the friends of such patients to observe, night and morning, the temperature; and if this should rise beyond limits of health, they should at once commence the administration of aconite, and not allow some hours to pass before the patient can be seen by the medical attendant. It is true the fever may depend on some other complaint than inflammation of the kidney; but it will even then probably be inflammatory in character, as from gastric catarrh, over-feeding, and the like, in all which cases the aconite will be equally efficacious.

Whether aconite is of use in the fever of acute specific disease, as scarlet fever, measles, &c., is not so certain as its power over inflammation. But although there may be some doubt whether this remedy can lessen the severity of the fever of the acute specific diseases, there is no doubt it can control and subdue the inflammatory affections which often accompany them, and which may by their severity endanger life. Thus aconite will moderate the inflammation of the throat in scarlet fever, and the catarrh and bronchitis in measles, and in this indirect manner lessen the height of the fever. It appears to be unable to shorten the course of these acute specific diseases. In the treatment both of simple inflammations and acute specific diseases, aconite may be appropriately administered in conjunction with some other remedy which may be indicated.

The treatment which has just been described will be found of value in erysipelas, in which disease belladonna may also with advantage be given. In the treatment of acute rheumatism aconite has been much praised, and from the eminence of the authorities by which it has been recommended there can be no doubt of its usefulness. Still in this complaint its good services are not so apparent as in acute inflammation. This disease has no regular course of duration, but may, untreated, last only a few days or many months. It is difficult, therefore, to decide whether the speedy decline of the fever in some cases is a natural decline, or has been accomplished by the aconite. It is certainly ineffectual in many cases, which appear to run their course uncontrolled by this remedy. So that it is still required to determine in what class of cases it is useful, and in what cases it is without effect. In one respect it often appears to be of service—namely, in removing the pain from inflamed and swollen joints.

Gouty pains are said by some to yield to this remedy, and it has in many instances apparently with good results, been given to persons suffering from neuralgia.

The effect of this remedy on the heart has been mentioned. There it was shown to lessen the rapidity of the circulation. Aconite may thus be used in all cases where there is vascular excitement which it is desired to suppress, and also when it is desirable to diminish the force of the circulation. In fact it may be given in precisely those cases which were formerly treated by bleeding.

This remedy may be employed with advantage when the menses are suddenly checked, as by cold, on account of its power to restore the flux, and so remove the distressing and peculiar symptoms which not unfrequently occur when such a disease is produced.

The "fluttering at the heart" of nervous persons, and also nervous palpitations generally yield to this remedy. Usually when such disturbances occur, more general treatment is required, but when the conditions causing the palpitation cannot be discovered or cannot be removed, then aconite may be usefully employed.

The acute stage of gonorrhœa may be well treated by a drop of the tincture of aconite each hour, and the same treatment will often remove cordee.—*Lancet, Jan.* 9, 1869, *p.* 42.

111.—ON POISONING BY STRYCHNIA.

By Dr. Chauncey Puzey, House-Surgeon to the Liverpool Royal Infirmary.

[A man, 24 years of age, was admitted into the Liverpool Royal Infirmary, on Tuesday, Feb. 18th, 1868, at 2 a.m., suffering from acute tetanic symptoms said to be the result of poisoning by strychnia. He had taken sixpennyworth of Hunter's vermin powder by mistake.]

On admission, at 2 a.m., he was cold, with feeble rapid pulse, face congested, and skin clammy; breathing short and hurried. At intervals of every three or four minutes, a spasm came on, in the form of well marked *opisthotonos*. During the spasms the respiration became hissing, jaws fixed, eyes very prominent, face congested and livid, and the man appeared as if he would die of asphyxia.

Each spasm lasted not quite two minutes, then there was about two minutes' interval, during which intervals the man was quite conscious, and described his sensations after taking the poison. Thirty minutes after admission he vomited again. (In the vomited matter, a trace of strychnia was found.) The act of vomiting was accompanied by great pain, and was of a peculiar spasmodic, jerking character. He could swallow nothing, so it was determined to try subcutaneous injection. At 2.30 a.m., one third of a grain of morphia was injected into the calf of one leg. The introduction of the needle brought on violent spasm, but in five minutes the man expressed himself as being easier than he had been for the last two hours, and the attacks became less frequent and less severe. About 3.15 they began to increase again, and a third of a grain of morphia was injected into the other leg, with renewed benefit. Shortly before this, the patient seemed so exhausted, and the pulse so feeble,—in fact hardly perceptible during the spasm,—that small quantities of brandy and water were frequently given, at first with considerable difficulty.

At 5.30 a.m., he had been dozing a little, and the spasms had been much less violent, but they appeared to be returning a little more frequently. Their character was, however, much altered, as they came on with sudden jerks that nearly threw the patient out of bed, causing him sudden acute pain, but unattended by trismus. A quarter of a grain of morphia was injected, and the brandy stopped, as his skin was much warmer, and pulse better.

At 7 a.m. he was again seen, and was so much better that nothing further in the way of treatment was thought necessary; but every now and then a sudden jerking spasm would seize him. These gradually became less violent, and by the afternoon had altogether ceased. He suffered from considerable pain and tenderness for several days afterwards, and slight ecchymoses appeared about the legs and arms, where the spasms had been most severe.

He went out quite well in less than a week.

It appears to me that there are two or three points in this case worthy of notice.

There seems to be no doubt that the man swallowed the whole powder. Mr. J. C. Brown, B. Sc., the lecturer on Chemistry and Toxicology at the Infirmary School of Medicine analysed a similar powder for me, and found that it contained exactly *three grains of strychnia*. (This according to Taylor is usually a rapidly fatal dose.) He vomited a little about an hour after taking the poison, but it must have been nearly two hours before the con-

tents of his stomach were evacuated, for the emetic given him by the surgeon who was called to see him did not take effect until he was being brought in a cab to the Infirmary, at 2 a.m.

But after this a considerable quantity of strychnia remained in his stomach, for at 2.30 he vomited again, and in a small quantity of the vomited matter, collected and analyzed by Mr. Brown, there was found 1-10 of a grain.

It appears probable that the absorption of the poison had been retarded to a certain extent by the state of the man's stomach, he having been drinking spirits freely that night, and that to this fact he owed his escape from speedy death within an hour.

As regards the treatment adopted, it consisted of three things—

1st, An emetic to remove the poison remaining in the stomach;

2nd, The injection of morphia, to put a stop to the convulsions, the result of the poison already absorbed; and

3rd, Stimulants to overcome the exhaustion due to the spasms.

Neither the first nor the second part of the treatment would *per se* have been sufficient. Of course, it would have been unreasonable to trust to the morphia whilst any poison might still be in the stomach; and it was evident to bystanders that the emetic alone would not have saved the man's life, as he must almost have certainly have died from exhaustion if the tetanic symptoms could not have been relieved, and his strength at the same time supported; and in no way could this so soon be effected as by the hypodermic method.

Probably many would suggest that the administration of chloroform would have succeeded as well. But, in the first place, it appeared to me that it would be difficult to combine this with the administration of stimulants and support to the patient; and again, I thought it a less safe method of treatment. For it seemed so likely that the man would die, during, or immediately after one of the convulsions, that I was fearful, lest, supposing such a thing occurred whilst he was inhaling chloroform, death might be attributed to *it*. In the Medical Times and Gazette of May 9th, of this year, and in that of the 27th of June, 1867, cases of recovery after strychnine poisoning are related where chloroform was found to act in the most satisfactory manner. But even supposing each mode of treatment to be equally safe, there can be no doubt, I think, which is the more convenient, where there is not a staff of assistants to relieve each other in the administration of the remedy.

The effect of the hypodermic injection was manifest almost immediately. In five minutes the patient expressed himself as being easier than he had been for two hours before, and in half an hour he was able to swallow frequently small quantities of brandy, without which it appeared likely that he would sink from exhaustion. To the necessity for the administration of stimulants in such cases, Mr. Phelps draws attention in his observations on one which he treated at the Northern Hospital in this town, five years ago, and which is the second of those I alluded to above. In his case, beef tea and brandy were injected into the stomach whilst the patient was under the influence of chloroform.

The effect of the morphia was only temporary, for the injection had to be repeated in three-quarters of an hour, and again in two hours more.

The change in the character of the symptoms, as the effects of the poison were passing off, was peculiar, the violent tetanic spasms gradually becoming weaker and weaker, and then being replaced by short sudden jerks or starts of apparently every muscle, occurring at uncertain intervals, and calling to the mind of the observer the slight and interrupted shocks given off by an electro-galvanic machine after it has been worked for a considerable time.—*Liverpool Medical and Surgical Reports, Oct.* 1868, *p.* 89.

112.—ON A NEW AND SIMPLE METHOD OF INDUCING ARTIFICIAL RESPIRATION IN CASES OF ASPHYXIA FROM DROWNING, STRANGULATION, CHLOROFORM, &c.

By Dr. W. P. Bain, Surgeon to the Poplar Hospital.

The author introduces a plan hitherto not known in this country, the invention of the celebrated Pacini, of Florence, which consists in placing the patient on his back on a table or bed, the operator having his abdomen against the head of the patient, placing his hands in the axillæ on the dorsal aspect, and then pulling the shoulders towards him with an upward movement at the same time. The shoulders are then relaxed, then the former movement, and so on alternately. In many cases operated on by this method the air makes a loud noise when it passes the larynx, as in snoring.

The author was so impressed with the excellence of this plan that he determined on his return from Italy to make experiments on it, as suggested to him by its illustrious inventor. He had not long, however, proceeded with these before he discovered two modes considerably superior, and throwing also somewhat in the shade the labours of Marshall Hall and Silvester. In experimenting on the dead subject he employed an india-rubber tube, one end of which was tied in the trachea, and the other communicated with a small spirometer, upon the principle of Hutchinson's, so that the passage of air to and from the lungs could be easily observed by means of a scale showing cubic inches. He found that the simple process of raising the upper part of the thorax from the table by taking hold of the arms caused a considerable influx of air, varying with the angle that the arms made with the body. For instance, if the body were raised by the arms at an angle of 45° (towards the face) the inspiration would amount to, say, 20 cubic inches. If the body were lifted by the arms in a vertical direction, the amount would be 15 cubic inches, and if pulled up by the arms at an angle of 45° (towards the feet), the amount would be about 10 cubic inches. But by the first of these modes a quantity of air considerably greater than by Hall's or Silvester's plan was generally obtained.

The best and most simple method, however, which the author has discovered is founded upon those of Silvester and Pacini. He simply places his fingers in the axillæ in their front aspect, with his thumbs over the outer ends of the clavicles, and draws, with a certain amount of power, the shoulders towards him. On relaxing his hold, the shoulders and chest return to their former position, and so on with alternate motion. In this case, therefore, there is only one movement to be effected instead of three, and he avoids the fatigue of having to bear the weight of the patient's arms as well, as is required by Dr. Silvester's method. It has the advantage also of being accomplished in a more rapid manner than any other plan. As far as the author's experiments have gone, the quantity of air inspired at each movement by this plan is about 30 to Dr. Silvester's 20, and as the operation can be conducted with much greater rapidity, the author considers that at least twice the quantity of air can be inspired by this mode than by any other yet known; and he expresses a wish that a subject which is of such practical importance should be further investigated.

The paper was illustrated by lithographed tables, setting forth results of successive experiments with the various methods; and Dr. Bain explained that in the first experiment, the method of Silvester was first used, then that of Marshall Hall, then that of Pacini, then his own four methods in succession; and that the series was then recommenced with Silvester's method again.

Mr. Bowles said that the description of the Marshall Hall method as given by the author of the paper, was incomplete, and that, if practised as described, the method had not been fairly tried. Pressure on the spine when the patient was rolled into the prone position was an important element, and this had not been mentioned. In cases of drowning, the first thing to be done was to get rid of the water from the lungs it having been proved by the

experiments instituted by the Committee of the Society, that this water was the chief source of danger to life. The presence of water in the lungs of drowned persons had also been shown by Professor Casper. In the case of a patient brought to St. George's Hospital, and who died there shortly after arrival, water was found in the lungs churned into foam by the air introduced by the diligent practice of Silvester's method. In a case managed by Mr. Trollope, of St. Leonard's, the method of Silvester was first tried, and as the patient seemed to be losing ground, the Marshall Hall method was substituted for it. Water then flowed out of the mouth, and the patient ultimately did well. We do not usually find water in the mouth, because it escapes easily, even from the larger bronchi, during the transport of the patient; but it does not escape easily from the smaller tubes, and in them it may soon be churned into froth. There is no difficulty in the introduction of air into the chest, but the introduction of air is useless while the patient is in the supine position, and while water is retained. A person with suspended animation requires but little air, and any method will introduce enough, The important question is, By what method can the water best be got rid of? In conclusion, the necessity of perseverance, even in cases of apparent death, was dwelt upon by the speaker, and instances of recovery after prolonged immersion were related.

Dr. Silvester remarked upon the possible injury to the parts entering into and surrounding the shoulder-joints, as an objection to Dr. Bain's method. He thought it similar in principle to his own, but that it was safer to act upon the chest through the arms. He objected to frequency of artificial movement; and maintained that, if the movements were too frequent, air would not pass below the bronchi, as might be determined by the use of the stethoscope. Dr. Bain had explained in what order his experiments were to be read; and, so reading them, they seem to show that the power of introducing air into the chest increased in proportion as the efforts of the operator were continued. Dr. Bain had been less successful with his (Dr. Silvester's) method than the Committee of the Society; and he would himself undertake to introduce into the chest by means of it, not thirty or forty, but sixty, cubic inches of air. He was himself desirous to get rid of water when it was present, but did not believe that it usually entered the lungs. He had failed to introduce it even by injection; and, if it did enter, it could not be got out again either by the Marshall Hall method, or by position. The Marshall Hall method was not new, but had been used and reported upon by the Royal Humane Society a century ago. It was open to grave objections, and often seriously injured the patient.

Dr. Headlam Greenhow observed that Dr. Bain's method was certainly the best, if excellence could be tested by the quantity of air that was introduced. He believed that water was distinctly inhaled into the lungs in drowning, when people fell into the water in a state of consciousness, and made efforts to breathe. Water was not found in the lungs at post-mortem examinations unless they were made soon after death. It became absorbed or in some way disappeared. The period of immersion after which recovery would be possible would vary very much in different cases, and would be the longest where there had been no efforts to breathe (as when people were stunned when they fell into the water), by which water could be forced into the lungs.

Mr. Carter expressed surprise that the best means of maintaining artificial respiration had not been adverted to by any speaker. This was the application of a Faradaic current to the phrenic nerves, where they pass over the scaleni muscles, according to the method described by Professor Ziemssen. By this means patients apparently dead from chloroform, and from the inhalation of carbolic acid and of coal gas, had been restored to life; and recently Pernice had applied the same means successfully to new-born children, who could not be made to breathe in the ordinary way. One of the convenient galvanic batteries now made by Stöhrer and others should always be at hand when chloroform was being administered, or at places where deaths by drowning were liable to occur.

A Fellow suggested that Dr. Bain's plan might be used in the prone position, which would facilitate the escape of water.

Mr. Jones said that several years' experience as house-surgeon at St. George's Hospital led him to prefer the method of artificial respiration by intermittent pressure upon the parietes of the chest and abdomen. The difficulties of the Marshall Hall method were very great, especially with heavy or bulky patients. He related the case of a new-born child apparently dead, and tied up in a parcel with a ligature round its neck, but that eventually recovered, to illustrate the importance of perseverance in efforts to restore suspended animation.—*Lancet, Dec.* 19, 1868, *p.* 799.

113.—CASES OF PLUMBISM.

By Dr. Edward Clapton, Assistant Physician to St. Thomas's Hospital.

[Some of the worst and most distinctive cases of lead poisoning occur in persons who handle lead in the metallic state, or who absorb it in some other form than the carbonate. In cases arising from handling lead the symptoms are generally those of arthralgia and hyperæsthesia of various parts, and sometimes of palsy of the extensors of the wrists, but seldom acute colic.]

The following are a few of the cases (very briefly described) which have recently occured at St. Thomas's Hospital:—

J. W., aged 39, an engine fitter, had been for a month or two engaged in fitting pipes by means of white lead. Symptoms were tympanitic abdomen, tenesmus, a white furred tongue, a slow small pulse, and a blue line along the gums. Had similar attacks twice previously from the same cause. Was ordered magnesiæ sulphatis ℥ij., acidi sulphurici diluti ♏x., tincturæ hyoscyami ♏xx., aquæ menthæ piperitæ ℥j., ter die. Was soon well.

J. T., aged 33. Had been a leather-dresser until ten months ago, when he was employed in extensive white-lead works. Symptoms were nausea, constipation, enterodynia, neuralgic pains, especially in lumbar region, a brownish white fur on tongue, a small quick pulse, and a very distinct blue line, especially on the upper teeth, which were greatly decayed. Ordered hydrargyri subchloridi gr. ij., opii gr. ss. horâ somni. Magnesiæ sulphatis ℥ij., acidi sulphurici diluti ♏xv., ex aquâ menthæ piperitæ ter die. Was very ill for some days, and only slowly recovered under quinine and iron treatment.

C. D., aged 32, a painter. Suffering from a combination of plumbic neuralgia and gonorrhœal rheumatism. Had for a long time aching pains in various parts, and recently contracted gonorrhœa. Has now slight gleet and intensely acute pains in the joints. Deep blue line on gums. Ordered potassii iodidi gr. iij., liquoris potassæ ♏xx., pulveris cubebæ ℈j., mucilaginis acaciæ ℥ij., ex aquâ ter die. Pulveris ipecacuanhæ compositi gr. v. omni nocte. Required no alteration of treatment, and was well in three weeks.

J. S., aged 43, a man cook. Suffering from a severe attack of icterus of a week's duration. Employed in an underground kitchen of a London railway terminus, where there are a number of leaden pipes conveying steam. Had suffered severe tormina and constipation for several days before being jaundiced. A deep blue line on the gums. There was no other way of accounting for the introduction of lead into the system except by the steam escaping through several holes in the leaden pipes. Ordered pilulæ hydrargyri gr. v., extracti hyoscyami gr. v. statim. Haustûs sennæ compositi ℨ ij., post horas quatuor. Magnesiæ sulphatis ℥j., sodæ bicarbonatis gr. x., ex aquâ menthæ piperitæ ter die. A hot bath. For several days the griping pains increased and the jaundice did not lose its intensity. On the following week was ordered hydrargyri subchloridi gr. ij. alterâ nocte. Magnesiæ sulphatis ℥j., infusi rosæ acidi ℨj., ter die. After this he rapidly recovered.

A short time ago two other cases of a similar character attended as out-patients—viz., cooks employed in a kitchen at another London terminus, both of whom had dropped wrists, general debility, and an ictero-plumbic appearance. They both stated that they were obliged to inhale steam all day which escaped from leaden pipes.

J. K. aged 49, a labourer. Suffering from acute colica pictonum of five days' duration; the third attack. His occupation entirely consisted in

making leaden pipes, and involved constant standing over molten lead. The present attack was preceded for two days by vertigo, languor, anorexia, and slight alvine flux. Acute constipation, attended with great pain, then set in. Blue line very distinct. Ordered magnesiæ sulphatis ℥ijss., infusi rosæ acidi ℥jss., ter die. Pilulæ hydrargyri gr. v., pilulæ rhei compositæ gr. v., alterâ nocte. For several days he became much worse, and recovered very slowly under the influence of sulphates and tonics.

G. H., aged 20, a painter. Suffering from epileptic fits, occurring about once in a fortnight, severe in character, and of three years' duration. A distinct blue line on the gums. Ordered zinci sulphatis gr. ij., ferri sulphatis gr. ij., magnesiæ sulphatis ʒ ss., ex aquâ menthæ piperitæ ter die. Subsequently the sulphate of zinc was increased by degrees to twenty-four grains for a dose. The sulphate of magnesia was reduced to fifteen grains, and then omitted. There had not been a single fit whilst under treatment—a period of five months—and the blue line almost entirely disappeared.

W. D., aged 32, a painter. Had for some time laboured under frequent attacks of cephalalgia and vertigo, and twice from epilepsy. Had several attacks of colic during the last ten years. Is very feeble, and has an exceedingly plumbo-cachectic appearance. Ordered potassii iodidi gr. vj., syrupi ferri iodidi ʒ j., infusi calumbæ ℥jss. ter die. Improved rapidly in all respects, and will probably be soon well.

A case of insanity, of two years' standing, in a painter, came under my notice the early part of this year, and was similarly treated. He was well, and able to resume his ordinary duties in three months. He had never suffered from obvious lead disease, but a blue line denoted the existence of lead in the system.

In considering the treatment of cases of lead poisoning, we are naturally led to reflect on the exact *modus operandi* of their chief remedies—the sulphates and iodides. In the one case we are supposed to render the lead more or less inert by inducing its most insoluble form, and in the other to eliminate it after having first rendered it as soluble as possible. It is not, however, as a simple iodide that the lead is thus rendered soluble, for we know that the iodide of lead is an insoluble salt, but as a double salt—probably the iodide of lead and potassium, which is very soluble. The actual condition in which lead exists in the system after absorption is not easy to determine. As regards the inhalation of the particles of carbonate of lead, any organic acid will set free the carbonic acid, and form a soluble salt, which is taken into the circulation, or perhaps the carbonate is rendered soluble in the lungs by excess of carbonic acid. When the metal is constantly in contact with any portion of the skin, especially if there be any degree of friction, as we find in plumbers, compositors, &c., it is either absorbed in a molecular state or becomes acted upon by some organic acid, or it may be absorbed through an abraded surface. It was probably by the action of some organic acid that the piece of leaden bullet in the cheek in the case already alluded to was acted upon, and thus induced so intense an attack of lead-poisoning, the bullet not having become regularly encysted as generally happens. There was no other way of accounting for the introduction of lead into his system. Cases have been recorded in which colic was produced by leaden bullets having been swallowed. The fact is that lead has a greater affinity for animal matter, as well as a stronger tendency to combine with organic acids, than perhaps any other metal has. Witness the way in which various animal tissues, colouring matters, neutral matters, and organic matters generally are so readily thrown down by subacetate of lead. Thus it is, no doubt, that the blood deterioration is induced. The action of the lead on the various principles in the blood day by day exerts this influence, until at last the true saturnine cachexia is developed; and as soon as this has reached the utmost limit of which it is capable, the lead begins to be deposited in various solid tissues, as the brain, liver, muscles, and skin, either in the form of suboxide or of the metal itself in a molecular state. When redissolved, and again circulating in the system, as by the action of iodides, it is by the intestinal canal and by the skin, the latter especially, that the effort of elimination is exerted; but still the

lead cannot attain any form which can be completely exhaled by the skin, and so is deposited in its tissue. We know that sulphureous baths will cause the surface of the body to be discoloured in the most marked manner, and this doubtless is the reason. Not long ago I tried the effect of the sulphureous bath in two cases of chronic plumbism of a severe character, the one having been treated with iodide of potassium, the other with tonic and purgative sulphates. In the former instance, the skin was here and there decidedly blackened, in the latter not appreciably so. In the former, the lead was no doubt freed from various internal organs by being rendered more soluble and directed to the skin; in the latter, fixed in a still more insoluble form. Very much has still to be learnt in respect of these points, but unfortunately the means of investigation are limited. The great requirement of the day is a right knowledge of the chemistry of the living fluids, both in health and in disease, and also of the chemical changes which the various medicinal substances undergo in the living organism. I hope that the new Clinical Society will give an important impetus to investigations of this nature. As to the blue line on the gums in plumbism, I have seldom found it absent except in those who have lost their teeth. It is often continued along the teeth for some distance, and much more distinctly so in the case of decayed teeth. It has a very different appearance from discolorations from other causes. In several oil- and colour-men I have noticed a deep mahogany-coloured stain on the gums and teeth. In a recent communication I have shown that those who suffer from the poisonous effects of copper have a very distinct green stain on the teeth, and this has subsequently been amply verified by the attention of several others being directed to this point and by my examination of many other workmen in connexion with copper and brass works. I find that the powder which the artificial flower makers use, and which produced symptoms of copper-poisoning, with a deep green stain, in a case which I described, is emerald green or aceto-arsenite of copper. The diagnosis of paralysis from lead poison is always easy. In nearly all cases the history readily elucidates the cause, and there is the blue line on the gums; but the chief distinction is that in all other forms of paralysis there is more or less anæsthesia as well as loss of motive power; but in that from lead there is more or less hyperæsthesia. I have at the present time under my care an out-patient suffering from dropped wrists, having precisely the appearance as though of plumbic origin, but in reality induced by a violent blow on the back of the neck. He has considerable loss of sensation in his arms, as well as loss of motion. With respect to the treatment of chronic cases, then, the great object is to get the lead out of the system. Nervine tonics, galvanism, chalybeates, and blood restorers are all useless unless some mode of elimination has been previously or is simultaneously effected. Iodides, purgatives, and sulphureous baths are the most reliable, though the latter are difficult of application. Some cases of dropped wrists are exceedingly obstinate, but galvanism, iodide of iron, and purgatives seldom fail in effecting a cure. I do not at all approve of the plan of placing the arms and hands in splints for the whole day, as is the fashion, as I am convinced that frequent friction and gentle exercise of the muscles of the arm form a most important element in treatment. As to acute lead colic, which consists in paralysis of the muscular fibres of the intestine with acute irritation of the sensory nerves, there can be no doubt the sulphates, anodynes, and purgatives are the right remedies. The sulphates are obviously for the purpose of diminishing the solubility of the lead, and this, we know, is equal to diminishing its poisonous influence. Such purgatives should be given as castor oil, which as an oil may also assist in combining with the lead in a form the more easily eliminated, or as those which increase alvine secretions—*e. g.*, mercury, salines, &c., the abdominal pain being greatly increased by such purgatives as act only on the muscular coat—*e. g.*, colocynth, aloes, senna, &c. Patients may be thus cured of colic, but not of plumbism, as long as the lead remains. To rid this, iodides, purgatives, tonics, and baths must be persevered with for some time. Sulphates, therefore, are more appropriate for the treatment of acute cases, and iodides for chronic. I have seen more than one case in which iodide of

potassium, given for lead palsy, had to be omitted for a time in consequence of inducing acute enterodynia almost amounting to colic, in the same way as this drug has so often caused salivation in patients who have previously been mercurialised.—*Medical Times and Gazette, Nov.* 28, 1868, *p.* 611.

114.—CASE OF LIPOMA NASI.

Under the care of J. W. Hulke, Esq., at the Middlesex Hospital.

Nowadays we do not often see the large, overgrown, knobby, purple noses which were formerly not uncommon. We owe this, perhaps, to our less intemperate habits. The cuticle in lipoma nasi is thin, and the cutis vera, with the underlying cellular tissue and the sebaceous follicles, is hypertrophied. When the lipoma has reached such dimensions as to greatly disfigure the personal appearance, the only applicable treatment consists in shaving down the overgrowth with the knife. The bleeding, although free, is usually soon checked, and the wound cicatrises quickly and well.

To Mr. Norton, house-surgeon, we are indebted for the particulars relating to this case.

A coachman, aged 49, was admitted into Pepy's ward on May 5th, 1868, with an enlargement and redness of the tip and sides of his nose, with dilatation of the orifices of the sebaceous follicles, which disfigured him so much that no one would engage him.

The lipoma was shaved down by repeated slices till the fibro-cartilage could be seen. The bleeding was soon arrested by pressure and ice, and the wound was dressed with unguentum simplex.

The patient left the hospital on the 1st of June, with a smooth even scar, and his personal appearance greatly improved.—*Lancet, March* 13, 1869, *p.* 361.

115.—AN ANTIDOTE TO SNAKE-POISON.

[The subject of poisonous snake bites has recently occupied a large amount of attention in Australia, owing to Professor Halford having employed his remedy—a solution of ammonia injected into the veins—with success in the case of a man exhibiting all the symptoms of snake-poisoning in an excessive degree.]

A man was bitten by a venomous snake, which he had taken into his hands, supposing it to be dead. Not long afterwards he became drowsy, and mentioned the occurrence to one of his mates. The latter immediately set about procuring medical assistance, but by the time it arrived the man was comatose, and his lower extremities paralysed. Galvanism and other usual remedies were applied, but without effect. In this extremity the medical man first called in caused Dr. Halford to be telegraphed for. The case was the first opportunity he had had of applying his new treatment to a human being, and he at first felt some hesitation in resorting to it. An incision, however, was made through the skin, exposing the superficial radial vein, and the point of the syringe being introduced into the vein, the injection (of ammonia) was completed. The beneficial effect was immediate. From an almost pulseless state, and from a stupor verging on death, the patient speedily became conscious. He has been steadily recovering since, and he is now reported to be nearly well. Whether the earlier treatment in any way contributed to the cure cannot, perhaps, be certainly known, but there appears to be little doubt—the medical men entertain none—that the case must have ended fatally but for Professor Halford's treatment. We require, of course, some further cases before the merit of the discovery can be determined. Ammonia is not a new remedy for snake bites, but Dr. Halford has the credit unquestionably of having applied it in a direct way by injection into the blood, so that its effects should be immediate and general. Its application in this way could only be safe in skilled hands. The discovery was not fortuitous, but resulted from a

consideration of the microscopical alterations which he found taking place in the bloodvessels of animals subjected to the snake-poison. It is only right to add, however, that the observations of Dr. Fayrer and others have failed to verify the statements made by Dr. Halford on the altered condition of the blood-corpuscles. We learn from a letter which Dr. Halford addressed to the Melbourne Argus, that he had previously instituted a series of experiments on the lower animals, and he publishes five of them which he performed on dogs. In four instances the treatment was successful. To carry out the treatment a solution of ammonia—of the strength of one part of strongest liquor ammoniæ to two parts of distilled water—and an ordinary hypodermic syringe are required. The ammonia is thrown directly, but gradually, into the blood by puncturing any superficial vein, and may be repeated as its beneficial operation ceases.—*Lancet*, *Jan.* 30, 1869, *p.* 168.

116.—ON THE ACTION OF ARSENIC ON THE HUMAN SYSTEM, ESPECIALLY IN REFERENCE TO ITS USE IN DISEASES OF THE SKIN.

By Thomas Hunt, Esq., Surgeon to the Western Dispensary for Diseases of the Skin.

We now proceed to inquire *how* is arsenic to be used in order that it may with safety, and almost with certainty, accomplish the absolute and permanent cure of those diseases of the skin to which it is adapted; namely, all chronic diseases of the skin which are neither contagious nor specific, neither strumous nor cancerous. These exceptions do not amount altogether to more than a seventh part of the number of the whole group, the syphilitic cases amounting alone to about an eighth of the whole. Arsenic, therefore, if rightly used, is adapted to the treatment of six out of every seven cases of chronic skin disease which we are asked to relieve. More than this, it may be said with perfect truth, that the diseases which are curable by arsenic are absolutely incurable without it, try what you will. The converse of this proposition is equally true, namely, in the excepted cases (one in seven) arsenic is utterly useless, administer it how you will. Here, then, we have a remedy for at least one half of the diseases to which man is subject, and which, if he live to his eightieth year, may cling to him and torment him almost from the cradle to the grave. We have repeatedly seen patients who have suffered from squamous disease for fifty years together without one single day's exemption. A fit of gout or stone is as nothing to this. But if skin disease, when severe and protracted, is about the most tormenting affliction which a man can have to endure, so, happily, these diseases, however severe or protracted, may with more certainty be cured by arsenic than any other disease by any other drug. Nay, there is nothing so certain in medicine as the healing power of the salts of this metal. The inquiry before us, therefore, is not an idle question. Its solution concerns many thousands of our suffering fellow-creatures, who are shut out of society all their lives, and are often willing to confess that they have thought seriously of suicide, and have long prayed for death.

To return to the question, then:—How is arsenic to be used?

In order to simplify the inquiry, we will suppose the preparation to be Fowler's solution, this being the most commonly in use with the profession. There is an objection to this preparation which will be considered presently. But it is an objection of little weight; and we proceed to inquire how it is to be used. *First*, it should be given in divided doses—three doses in twenty-four hours, simply to avoid an unnecessarily large dose. *Second*, it should be diluted with pure water, or if the case require the influence of antimony, the vinum antimonii, say thirty-five minims, may be combined with five minims of the liquor arsenicalis, and this may be taken diluted three times a day. *Third*, this dose should be taken with, or immediately *after*, a meal, in order, that being mixed with the patient's food, it may find a ready entrance into the blood, and that the bare possibility of its irritating the mucous membrane of the stomach or bowels may be avoided. Not that there is any danger of mischief, but the

patient, aware that he is taking arsenic, may thus be disabused of all fanciful or imaginary suffering of this kind. *Fourth*, it should be clearly understood that arsenic acts very slowly, and therefore it is best to begin with an average dose, say five minims of Fowler's solution, and this should be increased, not day by day, as was the practice thirty years ago, but two, three, or four weeks should be allowed to elapse before any necessity can exist for augmenting the dose. If, during this time, there should be set up an active or severe inflammation of the tunica conjunctiva in *both* eyes, the lower eyelid being swollen and showing on its lining membrane a horizontal streak of inflammation, then the medicine is not to be abandoned in a panic, but the dose may be reduced to four minims, and in a week or ten days the conjunctiva will be less inflamed; or, if not, a lotion of the liquor plumbi acetatis dilutus, or of cold black tea, will generally suffice to relieve the investments of the globe of the eye, and even to remove the slight degree of ecchymosis which is sometimes seen in the sklerotic tunic. But during this week, if the patient has been properly prepared for the course, the disease of the skin will show some amendment; it will be shorn of its strength, and from this time the cure will be easy enough, although it may take many weeks, or even months, to effect it entirely. If it should be requisite that the course be continued for several months, the soles of the feet, and less frequently the palms of the hands, become more or less inflamed or rough, and very rarely slight vesications occur on the feet. These inconveniences must be borne patiently: they will only exist during the course. Sometimes, also, after a protracted course, the skin of those parts of the body which are covered by the dress assume a dirt-brown, unwashed appearance, and under a lens present fine scales. This also is an ephemeral appearance, somewhat annoying to females of delicate complexion, but not for a moment to be compared with the afflictive form of disease which requires arsenical treatment. Other symptoms are sometimes complained of; such as restless nights, hiccough, pains in the stomach and bowels, depression of spirits, and general nervousness. But all these, except the first, are mere mental impressions. They seldom or never occur in dispensary practice, when the patient knows nothing of the medicine he is taking. And, on the other hand, it is far more common for the patient to feel better and stronger under the course. The feet and legs become warmer in those cases in which the extremities are habitually cold; and nothing is more common than for patients to say, after a long course of this medicine, that *they have never felt so well in their lives.*

Hitherto we have supposed that the dose has been rather in excess. But it often happens that the reverse is the case, and that after a month's treatment the medicine shows no sign, and the disease remains *in statu quo.* It will now be necessary to increase the dose slightly, and perhaps repeatedly, not every day or every week, but about once in a month, nothing doubting that the effects will sooner or later appear.

Meanwhile it must not be forgotten that we are not dealing with a mere *machine.* The health of the patient must be closely watched, and the secretions carefully sustained. Above all, the bowels must not be allowed to act sluggishly. In many cases a full dose of calomel and compound colocynth pill will be required two or three times a week; and these doses are sometimes essential to the cure. If the legs, or feet, or abdomen become puffy or œdematous, the urine being scant and turbid, the case will not go on well until we have roused the kidneys to vigorous action by full doses of spiritus ætheris nitrici and acetate of potash, largely diluted with water, and accompanied with draughts of some aqueous fluid several times a day. This treatment is seldom required, but when it *is* necessary it must be adopted, or the case will become unmanageable.

In other cases there will be present an atonic diathesis, with pale upper lip or amenorrhœa. Here we must combine iron with the arsenic, taking care that our chemistry is not at fault. We may mix the vinum ferri with Fowler's solution, or the tinct. ferri sesquichloridi may be combined with the liquor arsenici chloridi, taking care that the National Pharmacopœia does not lead us into error, of which there is no small danger.

It is never necessary, and rarely expedient, to exhibit triple compounds of arsenic, such as Donovan's solution, a very active but most unmanageable preparation. Neither mercury nor iodine should ever be given in combination with arsenic. Each of these three energetic and useful medicines has its value. Each acts in a different way, a way of its own, and each has its own peculiar power over disease. But mix them, and this distinctive power is buried not blended. According to the constitution of the patient, one or another of these remedies has the upper hand, and you have no means of ascertaining if each or either is defective or excessive in the dose, nor could you alter it if you had.—*Journal of Cutaneous Medicine, Jan.* 1869, *p.* 350.

117.—AN ADAPTATION OF THE REFLECTING MIRROR TO THE UTERINE SPECULUM.

By Dr. Leonard W. Sedgwick, London.

To see better is so frequently to know more that I do not hesitate to submit to the consideration of the profession an adaptation of the reflecting mirror to the uterine speculum, which for some time back I have found most useful.

The mirror is three inches and a half in diameter, and is of five inches' focal length. Like the laryngoscope mirror, it is mounted in a light metallic back, and to its circumference a brass arm is attached by a ball-and-socket joint, which is easily tightened or slackened by a screw movement. The arm can be lengthened or shortened by a simple telescopic slide; it is bent at a somewhat obtuse angle close to the joint, and is, when closed, four inches long. At its other extremity the arm is also bent at an angle, and is square; it fits into either side of a short socket attached to the upper surface of the outer end of the speculum, and is speedily secured there by a turn or two of a screw-cap.

By this means the mirror has a firm, easily fixed attachment to the speculum; and by the aid of the ball-and-socket joint and the telescopic movement it can be placed at any angle in relation to the axis of the speculum, and at such a distance from it as may be most convenient, or may afford the best illumination.

The mirror may, of course, be adapted to any speculum. It has been made for me, with their usual success, by Messrs. Weiss and Son; and I have latterly used it attached to a speculum of their construction, which, I venture to think, is the most satisfactory instrument yet made.

The form of the speculum originated, I believe, in a suggestion of Sir James Simpson. The lower blade is of the duck-bill shape; the upper is flat, and fits on to the lower in such a manner that a small interval is left between the two, so that in closing the instrument for withdrawal no pinching of the vaginal mucous membrane can occur. The upper blade is shorter than the lower one, so that when the speculum is opened the cervix is easily received into it. The duck-bill shape of the speculum secures the very easy introduction of the instrument, and also so distends the vaginal walls as to prevent their falling in and obscuring the view of the os uteri. By this configuration the wooden plug is rendered unnecessary, and lateral blades are made useless; both very desirable arrangements; for, by the consequent simplicity of construction, thorough cleansing of the instrument is facilitated, and no absorbing surfaces or tortuous chinks are left where infecting particles may lurk or be overlooked. The dilating mechanism is Messrs. Weiss's improvement of that of Custo.

By the use of the mirror thus affixed, it becomes unnecessary to alter the position of the couch or bed on which the patient is lying; for, wherever the source of light may be, the mirror can be so adjusted as to reflect it upon the cervix uteri.

There are no formidable preparations to be made; for the patient may lie in the usual obstetric position on the bed wherever it may be placed.

A better illumination is obtained by daylight, inasmuch as a larger amount of light-rays are concentrated on the spot to be examined than can be obtained by direct transmission. A better illumination is also obtained when artificial light is used; for not only does the same reflection of light occur as in daylight, but the part is relatively as well as positively brighter; for, as the lamp or candle may be placed on a table at some distance away, the great disadvantage of looking over or through a bright light at a place not so bright is avoided.

The impossibility of the occurrence of such unpleasantness as the dropping of grease or the singeing of bed-clothes is an additional recommendation.

In all cases one hand of the medical man is entirely set at liberty, and in many instances both are free. Where the speculum does not of itself retain its position, and both hands are needed, the finger of an assistant or of the patient herself serves to secure its steadiness.

If the mirror be on a lower level than the source of light—and this may always be managed—it does not interfere with the use of both eyes; and as it is always set at an angle, it is never in the way of any instrument which may be in use. One can thus accomplish with great certainty many necessary mechanical interferences with the os uteri, because both hands are at liberty, and one has a clear and continuous view of all that is going on, especially if the instruments used are, as they may often be, trowel-handled.

I may add that this mirror may be used attached to the rectum speculum with advantage.—*Lancet, April* 24, 1869, *p.* 561.

118.—REMARKS ON RHEUMATIC FEVER.

By Alfred Fleischmann, Esq., late Physician-Accoucheur-Assistant to King's College Hospital.

Since I entered the profession I have had thirty-four cases of acute rheumatic fever, under my care. In each case I have depended upon (1) alkalies, (2) opiates, (3) blisters, (4) flannel envelopes; and with these four remedies, the rest of the drug-list may be burnt. Had I to treat as many thousands as I have had units, I should seek no further for means of cure. After careful comparative watching, I find the acetate and nitrate of potash is the best conjunction of alkalies. I give a maximum dose of half an ounce of the former and half a drachm of the latter in a claret-glass of dill water every two hours, until vomiting or nausea is produced, or, failing that, until the sweat ceases to redden litmus. In some cases it is astonishing the weight of alkaline antidote that is required to neutralize the acid poison. In one case my patient took two pounds of the acetate and a corresponding amount of the nitrate before he had had enough. If these doses are exhibited and borne, the pain is, as a rule, mitigated in twelve hours. I do not feel sure whether it is better in all cases to give or withhold opium; I think it should depend upon the amount of pain, rather than the amount of disease. The complete envelopment in flannel and wadding is a valuable aid, for which we should never forget to thank that admirable physician, Dr. Chambers, of St. Mary's Hospital. Blisters should be a later resort, with the exception of one, half the size of a playing card, an inch and a half below the left clavicle—an application I look upon as an almost certain preventive of cardiac mischief. In all my cases I have had only *one* instance of *original* heart complication, and that was a case rather of carditis than of rheumatic fever (the patient was well and dead in thirty-six hours.)

Of course all this has been written a hundred times: I rewrite it, not as a novelty, but simply recording its adoption and success in my hands. I would make, however, one or two remarks which I do not remember to have seen in print. When a patient has once had an attack, he should, if an intelligent person, be prepared for his own consequent behaviour in any future attack. He should be armed with his alkalies, and not lose an hour in com-

mencing the treatment before the doctor comes; and if sufficient promptitude be used, the disease will be strangled in its birth. I have had some striking instances of this in my own practice. I had a valued servant who had some severe attacks before I knew her. She complained one morning to her mistress that she felt premonitory symptoms. I at once sent her to bed and put her upon routine treatment. She had every symptom of the fully developed disease except the joint swelling and pain. Her perspiration was so acid that, although the ventilation was right, it was perceptible to the nose a flight of stairs from her room. In three days she was about her work again. I make it a rule to give into my patients' hands the alkaline prescription, and impress upon them the importance of commencing with it immediately they recognize the symptoms. In three or four other cases I know the disease has thus been nipped in the bud, and severe illness averted. I firmly believe the key to the puzzle why in some hands alkalies fail is, that the doses are too small and time is lost. Small doses are useless. This large amount of alkali does, I think, tend to blood impairment; but full doses of the ammonio-citrate of iron soon restore the red particles. The ammonio citrate is, in most cases (where astringency is not wanted) the best iron-salt we have.

I rarely, if ever, prescribe any other form of blister except the liquid preparation. It has every advantage over other forms: notably, it *never* fails to rise over the exact area you desire. Early blisters control joint mischief, but under full alkaline treatment they are not wanted; and it should be remembered that the amount of pain a blister gives—*ab initio usque ad finem*—is not insignificant, and where movement is already synonymous with agony they needlessly add to it.

Another remark I desire to make, and that is—the relapse, which is a specific feature, and a very ugly one, in this disease, is often in defiance of all the care that may be taken. Does full alkaline treatment predispose to this? I cannot say; but this I know, that in relapse the alkaline treatment is of greatly diminished value. The helm is either answered very much more slowly or not at all. I have now such a case under my care; and I find that the immediate application of a band of liquid blister, about the size of a French (green) bean, two inches above the joint, is then of great value. Directly the patient feels the least joint pain, he himself paints on the blister. In such cases there is generally a much lower and more chronic inflammatory action, and the liquid blister, with iron and iodide of potassium, gives slow but satisfactory results.—*Lancet*, *May* 1, 1869, *p.* 598.

119.—CASE OF TETANUS TREATED BY BROMIDE OF POTASSIUM.

By Robert Brown, Esq., Carlisle.

[The patient was a boy 12 years of age. About the end of September suppuration commenced around the root of the thumb nail, and terminated in the death and removal of the nail. On October 4th he fell asleep on the grass, and awoke stiff and chilly. There was slight stiffness of the neck next day, and on October 8th there was rigidity of the spine and stiffness of the jaws.]

When admitted, two men carried him, perfectly rigid and bent, by the shoulders and lower extremities, from the cab to the ward.

State on admission.—He complains of stiffness in the back, neck, and jaws; of pain in the neck, especially along the course of the sterno-mastoid muscles, and of great thirst. The sterno-mastoids, together with the muscles of the back and abdominal recti, are very tense. He can move his jaws apart about ¼ of an inch. During a paroxysm of pain and spasm, one of which occurred shortly after admission, he cried loudly, rested on his occiput and heels, and his countenance distinctly presented the "risus sardonicus." Pulse 112, irregular. Skin hot and dry. Bowels inactive. Ordered injection of warm water. To have milk, beef-tea, arrow-root. Potass. bromid. gr. xx. every second hour.

13th October, vesp. Last night the bowels were freely moved; he slept little, but was quiet and easy. Has taken liquid nourishment freely. Paroxysms have been frequent and painful during the night; to-day they have occurred very often since 5 p.m. The boy perspires freely; can move his jaws apart fully ¼ of an inch. Pulse irregular, and so feeble that the beats cannot be accurately counted. Urine normal in quantity and quality. Potass bromid. gr. xx. every hour.

15th, vesp. Patient during the early part of last two nights has suffered from severe paroxysms, occurring on an average four in the hour, and accompanied with a sense of choking, but after 1 a. m. he has become easier, and has slept a good deal. Since 5 p.m. to-day, paroxysms have occurred on an average 3 to 6 during the hour, though before that time he had been free from them, and had slept for three hours, being awakened however, to take his medicine, &c. Pulse 78, stronger, but still irregular. He perspires freely. Bowels acted after an injection for first time since night of admission.

16th. Patient slept well during the night till 3 a m., when a paroxysm seized him, and almost threw him out of bed—such was its severity; it caused intense pain, and a wound of the tongue, by the sudden snapping together of his jaws. This morning he has taken milk and arrowroot for breakfast: lies quite easy, and perfectly freely free from pain, often dosing in sleep, with his mouth open fully an inch. He had to-day fifteen paroxysms in twelve hours. Tongue thickly coated with white fur. Breath fœtid. Bowels inactive.

17th. Last night at 1.30 a.m., the house-surgeon was summoned by the nurse, and found the boy convulsed in a violent paroxysm. His arms were violently contracted, the sardonic grin well marked; opisthotonos extreme; breathing hurried and laboured; blood and saliva streaming from the mouth; tongue bitten in two places; face livid. The paroxysm lasted for three minutes, and subsequently he lay for half-an-hour exhausted and prostrate. This morning he is easy, and sleeps hour after hour. Ordered injection. Hydrarg. subchlor., gr. ii.; pulv. rhei, gr. vi. M. et. ft. pulv.

18th. Patient had two violent and a few slight paroxysms during the night. Bowels acted twice. Pulse 84—89, weak. Ordered sherry ℥ss every fourth hour.

Vesp. During the day has had twenty-four paroxysms in twelve hours.

21st. Patient has passed easy nights, and slept well since last report. Yesterday he slept nearly the whole day, being awakened every hour to take medicine. During the night there occurred fifteen paroxysms in four hours. To-day he thinks the stiffness in the neck is disappearing. Potass. brom. every second hour. Sherry ℥x. daily.

24th, vesp. The boy has progressed rapidly and favourably since the 21st. Has slept a great deal, and perspired freely, odour of sweat being fœtid. To-day he has been restless, and has suffered from three paroxysms in six hours, though he was free from them in the morning. Pulse 86, regular. Ordered an injection of warm water, which brought away a large, dark, fœtid stool.

26th. Progress very satisfactory till 3 a.m. (this morning), when he became restless, and suffered from paroxysms frequently, on an average three an hour. This morning he looks haggard, and, during the spasmodic attacks, the sardonic grin, the opisthotonos, with the clenching of the jaws, and contractions of the arms, and pain in the neck are as well marked as on the 18th and 19th, when he took the paroxysms most frequently. Pulse feeble and irregular. Ordered whisky ℥ ii. ℞. Potass. bromid. gr. xx. every hour. Ordered sherry, ℥ vi.

27th. Has become much easier, suffers less pain during a spasm, and sleeps hour after hour, save when he has to take his stimulants, fluid nutriment, or medicine which he does with avidity.

2 p.m. The house-surgeon was summoned by the boy's screams, and found him almost out of bed in a violent paroxysm—the nurse had left the ward for a moment. Ordered an enema.

1st November. Since the last paroxysm recorded, the boy has only had

four, which occurred on the 29th. Improvement rapid. He sleeps well, and eats voraciously. Pulse 96, weak.

Vesp. To-day he has had three paroxysms, one of which took place after an ineffectual attempt to sit up in bed.

6th. Has had no paroxysm since last report, when he began to take the bromide every second hour. Pulse 90. Improves daily. He still wears the facial grin, and complains of pain along the course of the sterno-mastoids, especially when he moves his head. Bowels acted freely. ℞. Potass. brom. gr. xx. every third hour.

10th. The boy improves rapidly, and without relapse. For the last two days he has been out of bed, and sitting on a chair; if he attempts to walk, he stumps along on his heels. Has still a broad grin, and stiffness in back and legs. His articulation is imperfect, owing to the rigid muscles. To discontinue whisky. Diet common; eggs ii. Sherry ℥ vi. ℞. Potass. bromid. gr. xx. ter in die.

25th. In a very satisfactory state.

2nd December. Discharged cured.—*Edinburgh Med. Journal*, *May*, 1869. *p.* 993.

120.—CASE OF TRAUMATIC TETANUS; RECOVERY UNDER THE USE OF THE CALABAR BEAN.

By Alexander J. Macarthur, Anstruther.

[The patient was a man aged 24, whose symptoms seemed to be excited by exposure to cold following the receipt of a punctured wound in the hand.]

On visiting him I found, on examination, that he had increased pain along the margins of the ribs, and also a feeling of stiffness in the neck and jaws, which I recognised as being the commencement of tetanus, and feared that he would fall a victim to that disease. He was ordered to bed, and to have one-eighth of a grain of the extract of Calabar bean; but as the druggist here had none of it—owing, as he said, to its being a remedy never inquired for—two days elapsed before it could be obtained from Edinburgh. In the meantime, I prescribed 8 grains of the ext. of conium every 2 hours, which dose, as it had no apparent effect, was doubled on the following day; and he was also ordered hydrarg. subchlorid. ii. grs., pulv. jalap xx. grs., which acted freely on the bowels. On the 4th of January, the day the Calabar bean arrived, the symptoms of tetanus were fully developed, and his condition was a very painful one. The appearance of his countenance was remarkable, from the lip being dragged into a kind of grin; his voice had a guttural sound, and it was difficult to make out what he said, as he had no power of articulation, from the lips and lower jaw being fixed. He complained of constant pain in the breast along the margin of the cartilages of the ribs, and in the back, about the lower dorsal vertebræ. There was not much arching of the back at this time; but on touching the part where he complained of pain, he was immediately thrown into a state of rigid spasm, with the back much bent backwards; this condition subsided in a few seconds. The abdominal muscles felt very tight, and he had pains in the groins and legs. His whole body was quite rigid, so that it was impossible for him to sit up in bed. He had lividity of the face, lips, and tongue, difficulty of breathing, and a short spasmodic cough, giving him great pain in the breast and back. The heart's sounds were normal; the pulse 88. His jaws were capable of being separated during the short intervals of spasm about a quarter of an inch, and he could only protrude the tip of his tongue. He begged of me to give him something to ease his breast and back, and, as he felt hungry and could not eat, he was very anxious to have something to appease his appetite. He was ordered milk, egg-flip, and arrowroot. He felt, on attempting to swallow anything, as if he would choke; for as soon as the fluid came to the pharynx a spasmodic action was set up which forced it back, and only very small quantities could be got over his throat at a time. He was now to have one-eighth of a grain of the extract of Calabar bean every hour.

6th January. Symptoms the same as at last report, with the exception that the pulse was 80, soft, and he said he felt a little easier in about a quarter of an hour after each dose of the medicine, at which times he could swallow a little better. I ordered the dose to be increased to one-sixth of a grain every hour.

7th. Complained very much of the frequent spasms, which occurred every three or four minutes, and had increased pain over the shoulders and in the legs; pulse 84, soft. To have one-fourth of a grain of extract every hour. In the evening the pulse was 120.

8th. The tongue which was loaded with a thick fur, could be protruded about a quarter of an inch; it was bitten on the edge by the teeth, owing to the sudden spasmodic closure of the jaw; the back was very much arched, and perspiration was profuse. He had great thirst, and a gurgling sound from the throat, arising out of a collection of stringy mucus, which at times he made a half-blowing, half-sneezing effort to get rid of; pulse 100. Ordered half a grain of the extract every hour and a half. In the evening the pulse was 92; the eyes had a peculiar hazy appearance, with pupils much contracted. His mother remarked that he had spent an easier day, and that he got some short snatches of sleep now—as the spasms, although very severe when they did come, were less frequent, having an interval of ten minutes or a quarter of an hour.

9th. Had much pain in the breast and back, also great uneasiness in the stomach; pulse 116; otherwise the symptoms the same as on last report; ordered three drops of dilute hydrocyanic acid every four hours, and half a grain of the ext. of Calabar bean every two hours. In the evening he felt easier.

10th. To-day the pulse fell to 80 and was very soft; he was much troubled with mucus in his throat, which he could not easily get rid of. Stopped the hydrocyanic acid—continued the half-grain of extract every two hours. He said he felt the need of the medicine about the end of the two hours. Pupils continued always very much contracted.

11th. The pulse was up to 100; spasms very easily excited by touching his back, and he felt so sensitive that the cold air reaching him, if the door of his room were opened, was sufficient to bring on a spasm. The Calabar bean to be continued, but the dose to be doubled every alternate two hours, so that he had half a grain at one time, and a whole grain at the next.

12th. Had delirium during the past night. Pulse 120; was afraid to put out his tongue in case of biting it; the muscles of the abdomen were very tense; still complained of pain in breast, back, and legs; ordered to continue the old dose of half a grain every two hours, but to omit the double dose, as I thought the delirium might be occasioned by it; sweating was very profuse.

In the evening I was sent for very hurriedly as he was thought dying, and on my arrival at the bedside I found him quite insensible, foaming at the mouth, breathing laboured and stertorous, pulse almost imperceptible, countenance very livid, and he had all the appearance of being very near death. His mother told me that he had suffered very much more from the spasms throughout the day, and regretted much that he had not had any of the Calabar bean since I had seen him in the morning, owing to the druggist's supply having run short. Fortunately I had a small quantity in my pocket, which I kept in case of having to use it subcutaneously, and as he was quite unconscious and unable to swallow, I injected half a grain in solution under the skin. The epileptic symptoms gradually subsided, and he was again quite conscious in about half an hour. The Calabar bean was continued as before in half-grain doses every two hours.

13th. Pulse 100; body much less rigid and spasms less severe; could protrude the tongue about half an inch, but was still afraid to do so; complained greatly of want of sleep.

17th. Since last report his symptoms have been gradually diminishing in severity, so I reduced the dose of the bean to one-fourth of a grain, and ordered a squill mixture, with camphor and dilute sulphuric acid, as he had loud mucous râles in the larger bronchi.

20th. During last night he had his first sound sleep since the commence-

ment of his illness. Found him asleep at the time of my visit, and the muscular system quite relaxed. He awoke while I was standing at his bedside, and the back was immediately thrown into an arched position, which subsided to its natural state in a few seconds. Bean to be taken in quarter-grain doses every four hours.

22nd. Pulse is now 60, tongue clean, feels his muscles stiff and sore, but can get up out of bed; and I had the satisfaction of seeing him walk, and also chew some food; he is evidently quite convalescent. Ordered him to stop taking his medicine.

This case of traumatic tetanus was marked by gradual progression; the symptoms being very slight during the period of accession, intensely severe at its height, and then gradually declining until recovery was established. The punctured wound, followed by exposure to cold, was evidently the exciting cause, and the first question to decide was, whether any removal of that cause could be effected by surgical treatment at the seat of the original injury. Amputation in tetanus is forbidden, unless the part to be operated on is in such a condition as to require it, independently of that disease; the more promising surgical treatment is the division high up of the main trunk leading from the seat of the injury; but with reference to such a procedure in this case, I came to the conclusion that, as the spinal cord was already in a state of super-sensitiveness to outward impressions, any operation on the nerves leading thereto would be only likely to aggravate the disease, and I therefore contented myself by applying hot fomentations to the hand and arm, and sought for the medicine which would produce the most powerful sedative effect on the spinal cord. From what has been written by Drs. Christison, T. R. Fraser, and Ebenezer Watson, regarding the properties of the Calabar bean, I was led to decide on it as being the medicine most likely to afford relief in tetanus, and the foregoing case is an illustration of its valuable sedative action on the spinal cord and medulla oblongata. The occurrence of an epileptic fit in this case, after the accidental want of the drug for some hours, at the height of the disease, is a remarkable circumstance; and it has led me to think that the Calabar bean may yet be found serviceable in the treatment of epilepsy, in which disease, so far as I have been able to learn, it has not yet been used.

Van der Kolk, in his work on Epilepsy, states that, for the rational treatment of that disease it is necessary, after removing as far as possible any remote cause, which by its action on the medulla oblongata keeps up the "increased capacity for morbid reflex movement and discharge of the ganglionic cells," to "diminish the excessive sensibility of the medulla oblongata, and to moderate, if needful, the superabundant determination of blood to these parts." Now the physiological action of Calabar bean fulfils these indications, and it does so better than any other drug known, by its having not only a sedative action on the medulla oblongata and spinal cord, but also a similar effect on the circulatory system, and is therefore free from the objection of producing a state of congestion, which attends the administration of the most powerful sedatives of the nervous system. Actual experience in practice will alone determine its value as a curative agent in epilepsy; but its properties would lead us to hope that good results may yet be obtained from its use in that disease.

The only other remark I have to make in connexion with this case is that in Sir Thomas Watson's work on the Practice of Physic, it is stated that, "in tetanus, there is no thirst, and seldom any accumulation of tough and stringy mucus in the fauces and about the angles of the mouth; but that in hydrophobia both these symptoms are always present." In this case of tetanus, thirst and accumulation of stringy mucus in the fauces were present in a marked degree, and it was a frequent question made to me by the patient what he could have to drink, as his thirst was so great, and his power of swallowing so much interfered with. I suppose that the presence of these symptoms, in this case, is to be attributed to the effects of the Calabar bean.—*Edinburgh Medical Journal*, *May*, 1869, *p.* 989.

121.—VOMITING OF PREGNANCY TREATED BY THE HYPODERMIC INJECTION OF MORPHIA.

By John Harrison, Esq., Congleton.

[The vomiting in this case was most severe and distressing. There was seldom a longer interval than fifteen minutes between the paroxysms of sickness. The stomach would retain absolutely nothing.]

On April 13th, after having tried external applications, nutritive and sedative enemata, vaginal injections, and numberless internal medicines, it occurred to me that hypodermic injections might be of service. I began with a solution of one grain of acetate of morphia in six minims of water, and injected one minim three times daily. At once the vomiting abated, and she gradually became stronger. The dose was increased to fourteen minims, but was only given twice in the day. This treatment was continued until July 1st, with occasional intermissions of one or two injections, that other remedies might be tried; but a tendency to relapse invariably occurred. I now determined to try if miscarriage could be induced by drastic purgatives and ergot. These means appeared to succeed. A fœtus was expelled, and the patient did well; but the gastric irritation continued, necessitating the continuance of the injections. However, on July 9th, I was able to reduce their strength and the frequency of their administration; and, on the 20th, discontinued them altogether. At this date, the menses returned, and the irritation of the stomach quite subsided. The patient was sent to the seaside, and is now quite well. She was reluctant to discontinue the injections, and was for a day or two depressed and hysterical, though not usually of this habit. She is more than ordinarily fat when well. She lost much flesh during the first part of her illness, but regained it soon after the injections were commenced. Fearing to establish a habit of opium-taking, the character of the injections was hidden from the patient. The skin of the forearms was pierced two hundred and sixty times. There was never any swelling or redness, except after two or three of the earlier operations, when the injection was accidentally endermic, rather than hypodermic. Suppuration never occurred. The bowels were sometimes a little constipated; and a slight disorder of the liver's functions was easily rectified by an aperient. The effect of the morphia was felt very soon after injection, in heightened spirits, toleration of food, and increased energy; but there was no marked drowsiness, contraction of pupils, or subsequent headache.—*Brit. Med. Journal, April* 3, 1869, *p.* 306.

122.—ON THE TREATMENT OF SUPPURATING JOINTS BY FREE INCISIONS.

By Thomas Bryant, Esq., Assistant-Surgeon to Guy's Hospital.

The treatment of a disorganised or suppurating joint has ever been a source of difficulty to the surgeon, and the larger the articulation that is affected the more that difficulty has been experienced, for the suppuration of a large joint, such as the knee or hip, too often threatens life in some stage of its progress, and the integrity of any joint, large or small, is, as a rule, compromised by suppuration.

How to preserve the natural movements of a diseased articulation is the first aim of the surgeon, and when that hope has gone his object is to save the limb. When this end can be obtained with a stiff joint, the result may usually be regarded as satisfactory, particularly in disease of the lower extremity, and even in the upper a cure by anchylosis is not so bad as some surgeons would lead us to believe. When neither of these ends appears probable, possible, or expedient, from the extent of the local disease, the general want of power of the patient, or the necessities of the individual case, the question of operation comes before the surgeon, and he has to decide whether amputation of the limb, resection of the joint, or incision into the articulation is to

be performed. To work out the many points involved in the solution of these questions is a task of difficulty, and a form of practice which is applicable to one joint may be inexpedient to apply to another.

This difficulty is doubtless due to the different value which surgeons place on different forms of practice, and the estimation with which they regard natural processes. One surgeon, having intense faith in natural processes in the cure of disease, and particularly joint disease, would attempt to save a limb that another would condemn, regarding any practice as wrong that interferes with a natural recovery, as long as any reasonable hope exists of securing such a result, and believing that a cure by anchylosis, however acquired and however long a time may be passed in securing it, is worth the attempt. A second surgeon, having stronger faith in surgical treatment, would excise a joint, believing it to be inexpedient to waste time for a natural cure, even when it may be gained, when by excision he believes an equally good, if not a better, result can be secured in a shorter period; whilst a third surgeon, looking upon both forms of practice as too protracted and uncertain, would remove the diseased part by amputation, in the belief that a more certain result and a more rapid recovery would be secured by such a process.

In brief, a case of disease of a joint that one surgeon would attempt to cure with anchylosis, a second would excise, and a third amputate—the two former schools amputating a limb only when all hopes of saving it by less severe measures have been proved futile.

In the present paper it is not my intention to consider the expediency of practising excision of a joint. On a former occasion I have fairly shown that in the knee it is only justifiable in exceptional cases. In its own place the subject of excision of other joints will meet with due attention, although I may admit at once its indisputable value in appropriate cases of disease of the shoulder, elbow, and hip-joints. I recognise the rule that amputation of a limb should only be performed when all other measures are out of question, and it is clearly a necessity to sacrifice a limb to save life. I have intense faith in the power of nature's processes to cure disease, and particularly joint disease, and believe that, in the majority of cases of joint disease, the office of the surgeon is mainly valuable in guiding natural processes in the way of cure. In the hip and knee a natural recovery with anchylosis is all that one can wish, and I believe this result to be a success such as a surgeon may look upon with satisfaction; and it is, as a rule, acquired without risk to life, and without much active surgical interference. In the shoulder, elbow, wrist, &c., it is not so bad as some surgeons would lead us to think, and it is fairly a question whether by excision in a large proportion of cases, a better result is to be acquired. These points, however, are not the subjects of my present communication, for in this I wish to demonstrate the value of a free incision into a suppuration or disorganised joint. I believe that such a practice is of great value in many cases—that by it many limbs may be saved, and as many helped on to anchylosis. I am, moreover, disposed to think that it has not been practised as freely as it deserves.

I propose on the present occasion to demonstrate the value of the practice by the quotation of such cases as my note-book affords.

But first of all let us stop to inquire briefly as to the cases in which it is expedient to apply the practice. Is it applicable to all cases of suppurating joints? If not, to which should it be applied? And these questions lead me to consider, although briefly, the pathology of joint affections, for, without pathology, practice must ever be uncertain, and unscientific.

To be brief upon these points, it may fairly be asserted that there are but two tissues in which joint mischief may be said practically to commence—the osseous and the synovial—although in certain cases of injury to the hip, knee, and other joints, in which much stretching or even laceration of the ligaments has taken place, disease may occur at their bony attachments—in the hip in the teres ligament, in the knee in the crucial; but even in these it is in the synovial membrane or bone that the disease shows itself.

To this general assertion it must, however, be added that disease rarely exists long in one tissue without involving another; and that, when dis-

organisation of a joint has taken place, every tissue will be more or less affected, but the extent to which the different tissues will be eventually involved rests entirely upon the original seat of the disease.

When disorganisation of a joint takes place as a result of acute synovial inflammation, or from chronic synovial disease, the articular cartilages may disappear, and the articular surfaces of the bones may be exposed, yet those articular surfaces will probably be only partially involved, and the great body of the bone will still be good. The disease, as far as the bones are concerned, will be superficial, and may be thus dealt with.

When disorganisation of a joint, however, takes place as a result of bone mischief, the synovial membrane will to a certainty have undergone changes with the articular cartilages, as in the former class of cases, but the cartilages will either have entirely disappeared or have been cast off or shed into the joint, or the portions that remain will be found resting on the bone. But the chief changes will be seen in the bone itself. The articular extremities will in all probability be extensively involved. More or less complete evidence of inflammation will be manifested either by partial or complete necrosis, local or diffused suppuration, or osseous consolidation. The disease in the joint, having been secondary to the disease in the bones, may require treatment, but the original seat of the disease must be remembered, and the treatment shaped accordingly.

Consequently, in disorganisation of a joint the result of primary disease of the synovial membrane, one kind of treatment may be found of value which will be inapplicable to other cases, and disorganisation of a joint the result of disease of the osseous structures may require a form of practice very different from that required in synovial disease; a correct diagnosis in these cases (as in others) being of primary importance, and as a guide to practice, of great value.

We will now proceed to the more immediate subject of this paper—the value of a free incision into a suppurating or disorganised joint—and will first consider in what cases the practice is most applicable.

First of all, the practice of making a free incision into a joint is only justifiable when disorganisation or suppuration has taken place, whether that suppuration be the result of a chronic disease or of an acute one following a wound of the articulation.

In acute suppuration of a joint, the result of a wound, I believe there is no better practice to be followed. A free incision into the articulation under most circumstances not only is the best local treatment, but the best general, for it seems to be true that, as soon as a free outlet for the pus has been made, surgical fever, although intense, may be expected to subside, and local symptoms to pass away. The incisions, when made, should, however, be free, that the escape of pus may be complete. By this practice joints will often be saved, and movement secured.

In disorganisation of a joint, the result of chronic disease, the plan of treatment by a free incision is not, however, so simple; for its value, already indicated, depends much upon the original seat of the disease. When the disorganisation of the joint has been secondary to disease in the articular extremity of the bone, to acute or chronic inflammation terminating in necrosis, partial or complete, it is not to be expected that a recovery is to take place by giving free exit to the suppuration in the joint, for the cause of this suppuration will remain after the adoption of the practice, and thus keep up the irritation and prevent a cure. The incision may relieve the symptoms, but will not cure the disease or do much towards hastening anchylosis. Nothing but the removal of the diseased bone, either after incision, as in an ordinary operation for necrosis, or by resection, will be of use; for the disorganisation of the joint is clearly the result of disease of the bone, and the seat of the disease must be made out before the correct treatment can be applied. An incision, as an exploratory operation, may, however, be of use in the case, for it may facilitate the removal of the diseased bone, and thus hasten recovery. When, however, the disorganisation of the joint has been the result of disease in the synovial membrane, the value of a free incision

into the articulation is very great, for in these cases, although the disorganisation may be complete, the disease in the bone will probably be only superficial, and will rarely be found to extend far into the cancellated tissue. The disease in the bone is the result of synovial mischief, and will consequently recover when the source of disease has been removed and the pus has been evacuated from the joint. Indeed, it is in disease of the synovial membrane of the pulpy kind, in which suppuration has taken place, that this practice of making free incisions into the articulation is carried out with the greatest advantage, and in the following cases which I propose now to relate I trust the truth of these remarks will be demonstrated.

Case 1.—*Pulpy Disease of Ankle-joint.—Recovery with good Movement after Free Incision into Joint.*—Tom W., aged 4, came under my care at Guy's Hospital on January 30th, 1865, with a disease of the ankle-joint. It was on the right side, and had existed for seven months, having come on after an injury, with pain and swelling. When seen, the joint was clearly much enlarged, the parts around the malleoli, &c., being doughy and thickened. There was pain in the part and daily flushing with heat, particularly at night. Fomentations were ordered, with tonics, and by February 20 all heat had disappeared, with all pain and indications of inflammation. The joint was consequently strapped up. The child was then, contrary to orders, allowed to use his limb, and as a consequence a relapse took place. The symptoms became as bad as—indeed, worse than—ever, and suppuration followed, an abscess opening on the outer side of the joint on May 15. On May 19 another formed about the inner malleolus, and it was clear that the joint was thoroughly opened. A free incision was made into the joint about the inner malleolus, and its contents allowed to escape without hindrance. Water dressing was applied. From this time everything went on favourably. By June 10 the abscess and the incision over the external part of the joint had healed, and all pain had ceased. By September things looked as if they were about to consolidate. On October 5, there was another relapse, and another abscess formed, and severe joint symptoms with constitutional disturbance made their appearance—indeed, it appeared as if an abscess had burst into the joint from the breaking down of some of the pulpy disease in the synovial membrane. The symptoms, however, gradually disappeared, and by November 27 all their severity had gone. From this date everything went on favourably, suppuration ceased, and all thickening of the synovial membrane gradually disappeared. By February 19, 1866, all the abscesses had healed and the sinuses were closed, and by April the joint resumed its natural aspect, all thickening of the soft parts having subsided. Strapping was again employed to hasten the absorption of the inflammatory products, and by April 9 the case was reported as well, with what was hardly to have been expected, a movable joint. By December, 1866, the joint was quite sound, perfect movement existing, the remains of the cicatrices and some weakness of the joint alone remaining to testify to the severity and nature of the disease. On December 7, 1868, this boy called on me, and the joint was still sound and useful, no traces of disease beyond the cicatrices remaining. The astragalus moved as smoothly as possible between the malleoli. He is still well.

Case 2.—*Pulpy Disease of Ankle-joint—Suppuration and Recovery—Treated by Free Incisions.*—William R., aged 9, was brought to me at Guy's Hospital on July 4, 1864, with a disease of his right ankle of two years' duration. It had appeared after a blow, with pain and swelling, and at uncertain intervals these symptons had continued ever since. When he came under observation the synovial membrane projected round the malleoli and was much thickened, and appeared in parts to be breaking down; any movement of the foot caused pain, and the astragalus did not move smoothly in its socket. A splint was applied and tonics given. For a time the symptoms improved with the child's health, and it was hoped that suppuration would not take place. In March of the following year, however, two abscesses formed, one on each side of the joint, and it was clear by the passage of a probe that the joint was opened. A free incision was then made on each side, laying the joint

open freely, and a splint was kept on, In six months the wound had healed, and the parts appeared to have become consolidated. In another three some movement in the joint appeared. In July, 1866, when last seen, the boy could walk well without pain. The movements of the joint were complete. The boy, however, required some extra support for his ankle, but had a good foot.

Case 3.—*Pulpy Disease of the Left Ankle-joint—Suppuration—Recovery with a Movable Joint.*—Cornelius M., aged 3 years, was brought to me at Guy's Hospital on December 14, 1865, for disease of his left ankle. It had come on after a fall, received some months previously, with pain and swelling, the joint being at times hot and painful. When first seen by me the articulation was clearly swollen from inflammatory infiltration of the synovial membrane. The whole part had a soft and pulpy feel, and the margins of bone were all covered in. There was no bulging of the synovial membrane from effusion, and the articulation moved smoothly. Fomentations with strips of wet rag were ordered to be kept on the joint, and the horizontal position was maintained; tonics were also given. By January 30 the symptoms had improved, but on February 26 they had again become severe, suppuration threatening. On March 12 an abscess was opened by a free incision in front of the inner malleolus, which was clearly connected with the joint; consequently a splint was applied. By June 25 all swelling had nearly subsided, and all heat had gone. Pressure with strapping was applied, and on September 3, six months after the incision, the child was declared to be cured, with a good and movable joint.

Case 4.—*Pulpy Disease of the Synovial Membrane of the Ankle-joint—Free Incisions—Recovery with a Good Joint.*—Alfred T., aged 5 1-2, came under my care at Guy's on January 1, 1866, for disease of the right ankle. joint of three years' standing. It had appeared after a fall, and had commenced with pain and swelling. When seen, the whole ankle was much swollen, soft, and pulpy to the touch. It was hot and painful, although some movement was allowed. Fomentations were ordered, and steel wine given, with good food. The boy was directed to be kept in bed. On January 29 an abscess appeared on the inner side, which was opened by a free incision, the pus clearly coming from the joint, for it could be pressed out. Water dressing was applied. The case went on satisfactorily after this for a time, but by June 14 a second abscess appeared on the outside from the breaking up of the inflammatory effusion. This was treated also by a free incision and water dressing applied; at this time the inner wound had quite healed. In three months the outer incision had also cicatrised, and the swelling about the joint had disappeared. Some movement of the articulation also existed. In August, 1868, nearly two years after this date, the child was brought to me, when the movements of the ankle-joint were smooth and perfect, the only marks of the old disease being the cicatrices and the weakness of the joint.

Case 5.—*Synovitis and Disorganisation of the Ankle-Joint—Recovery with Movement—Treated by Free Incision.*—Eliza M., aged 2, was brought to me at Guy's, February 25, 1864, for disease of the right ankle. It had existed for six months, and had commenced with pain and swelling. When seen the joint was clearly much diseased, although the cartilages were apparently perfect. There was great thickening of the synovial membrane all round the malleoli and the joint, and the parts were hot. Fomentations were ordered with tonics. On March 1 all the symptoms were worse, and suppuration of the joint was threatening. On March 31 the articulation was laid open on its inner side. The whole joint having apparently broken down, a splint was applied. Much relief followed the laying open of the joint, and from that time things began to mend. On May 10 there was little discharge, and by July the wounds had healed. The splint had been kept on during this period. By July 30 the splint was removed, and on September 10 some movement in the joint was visible. In December the movements were much more perfect, and on April 10, 1865, when the mother again brought the child, I was surprised to find that the foot moved freely and smoothly be-

tween the malleoli and without pain. The joint was weak and required some support, but it was sound.—*Med. Times and Gazette, May* 15, 1869, *p.* 514.

123.—IMPACTED FOREIGN BODIES IN THE NOSE.

By W. M. Banks, Esq., Liverpool.

[For a description of Dr. Thudichum's instrument refer to the article on ozæna in this volume by Mr. Banks, p. 145.]

There are two surgical accidents in which I am sure that Dr. Thudichum's instrument will not unfrequently be found of service. The first of these is the case of impacted foreign body in the nostril. Children, as every one knows, seem possessed of a mania for putting beads, marbles, beans, and similar objects into the nose. They seldom put them very far, or very firmly in, and there is no doubt that the actual impaction, or fixing of them, is often produced more by misdirected attempts to get them out than by anything else. I should certainly, before using any forcible efforts at removal by instruments, see what effect a rapid stream of water passed up the other nostril would have in dislodging the foreign body. In the number of the Lancet for December 17th, 1864, Dr. Skinner, of this town, shewed that long before Dr. Thudichum's paper appeared he had been practically making use of the principle upon which it is constructed. Dr. Skinner discovered it by mere accident, the instrument he employed being one of Higginson's syringes. In this letter, he gave the following very interesting account of the removal of a bead from the nostril. "In June, 1860, the child of one my patients was brought to me,—a little girl, two years of age, who had pushed an Indian bead up the right nostril. The mother had made vain attempts to pull it down, and succeeded in pushing it entirely out of sight, accompanied with profuse bleeding and terrific squalling. While the mother held the child's face over my basin, I forcibly injected some tepid water, by means of Higginson's syringe, up the left nostril, when the bead with one single compression of the elastic cylinder made its appearance in the basin." —*Liverpool Medical and Surgical Reports, Oct.* 1863, *p.* 110.

SYNOPSIS,

CONTAINING A SHORT ABSTRACT OF THE MOST PRACTICAL ARTICLES IN THIS VOLUME: SHOWING, AT A GLANCE, THE MOST IMPORTANT INDICATIONS OF TREATMENT PUBLISHED BY DIFFERENT WRITERS WITHIN THE HALF-YEAR. (ARRANGED ALPHABETICALLY.)

AFFECTIONS OF THE SYSTEM GENERALLY.

ALCOHOLIC STIMULATION IN FEVER.—It is quite an error to conceive of alcoholic stimulation as a proper substitute in cases of fever for ordinary food. Milk is the normal food of most persons in acute disease, and there are very few persons, even in severe fevers, who cannot receive it to the full extent of their powers of assimilation. To give brandy and beef-tea every hour or half-hour, and to continue this practice for days and nights together, even wakening up the patient in order to give him his food and stimulant, is the surest of all ways to destroy whatever remains of natural appetite. The proper use of alcoholic stimulants is to quicken and develope the appetite for real food, and the power of assimilating it. The proper and normal time therefore for giving these stimulants in fever, is along with the food. There are doubtless many cases of fever which are benefitted by them, but this is by no means the rule. (Dr. W. T. Gairdner, p. 17.)

CANCER.—The author recommends highly the use of arsenious acid as a caustic for the removal of cancerous tumours. He uses the following formula: Arsenious acid, 3 ij., mucilage of gum acacia, 3 j., well mixed together and made into a thick paste. No tumour more than four square inches in superficies should be treated on this plan. The paste is to be spread on a piece of lint an inch square, and applied over the tumour. In the course of twenty-four hours the surrounding parts will commence to swell, become red, and to a certain extent inflamed, but the pain caused is by no means severe. At the end of forty-eight hours to three days bread poultices are to be applied. A line of demarcation is soon seen extending round the mass, which separates gradually from the surrounding healthy tissues and comes away entire, leaving a healthy cuplike depression. On the removal of the first piece of lint it is in most cases desirable to repeat the application of the caustic, even several times, according to the size of the tumour. The value of the arsenious acid depends on its power of selection; for if put on with ordinary care the cancer alone is attacked. (Dr. A. Marsden, p. 42.)

GOITRE.—*Hypodermic Injection of Iodine.*—The author treats goitre by hypodermic injections of iodine. He began with four or five drops of the tincture and gradually increased the quantity, repeating the injections every eight days or so. (Prof. A. Lücke, p. 227.)

RHEUMATIC FEVER.—Rheumatic fever on an average only lasts seventeen days when it is treated by mint water. This is quite as favourable a result as follows the exhibition of alkalies, or the employment of blisters. (Drs. Gull and Sutton, p. 26.)

In rheumatic fever the tendency is for the heart to become diseased dur-

ing the first few days of the fever; and should it escape the early days of the disease, there is each day a lessening tendency to its implication. (Dr. Gull, p. 28.)

In the commencement of a case of acute rheumatism great and immediate benefit is often derived from the administration of aconite. The inflammatory process ceases, the skin cools, and the pulse decreases in frequency. It should be given in doses of two drops of the tincture every three hours. (Dr. S. Wilks, p. 37.)

The Alkaline Treatment.—The alkaline treatment of rheumatism has this great advantage, that the per centage of cases in which the heart becomes affected is only one in 48, whilst under non-alkaline treatment it is 1 in 4. The conclusion is arrived at from a careful observation of 158 cases, 48 of which were treated by alkalies, and 110 by other plans of treatment. It was observed that under alkalies the duration of the disease was shorter than under most other plans, a point, however, of little importance as compared with the safety of the heart. In the beginning of the disease where there is a rapid production of acid, the alkalies should be given freely, and, above all, frequently, but towards the end of the case they should be given in less quantities. The urine is the best guide as to the doses of alkali to be given. Perhaps a simple solution of citrate of potass in water is as effective and as little objectionable as anything. This salt may be given in the general quantity of about an ounce in the twenty-four hours; rather more at the beginning of the disease, less towards the close. (Dr. W. H. Dickinson, p. 38.)

Unless "the alkaline treatment" of rheumatism is properly understood, failure and even mischief will result from attempting it. The urine is to be rendered alkaline within twenty-four hours, and for this purpose from an ounce and half to two ounces of an alkaline carbonate must be given in that period, dissolved in a considerable quantity of water. Two drachms may be ordered to be taken in effervescence every three or four hours, in combination with an ounce of lemon-juice, or with half a drachm of citric acid. The amount of alkali must be rapidly diminished during the next three days, then if the urine still remains alkaline, a cinchona draught three times a day must be substituted for the alkali: with the bark scruple doses of bicarbonate of potash may be given if thought desirable. The bowels should be unloaded early in the case. No solid food should be allowed, and wine and spirits forbidden. (Dr. H. W. Fuller, p. 28.)

The reason why in some hands the alkaline treatment fails is that the doses given are too small, and time is lost. Half an ounce of acetate with half a drachm of nitrate of potash as a maximum dose, given every two hours until nausea is produced, or until the sweat ceases to redden litmus, will usually relieve the pain in twelve hours. (Mr. A. Fleischmann, p. 249.)

SCARLET FEVER.—If scarlet fever appears in a family, let the patient or patients be washed all over once or twice a day with diluted carbolic acid. This will always prevent the spread of the disease to the other members of the family. It should be used of the strength of one drachm to the pint of water. (Mr. A. Beardsley, p. 25.)

If chlorine gas be properly used in the sick-room of the patient, the contagion of scarlet fever will be confined to that room. Direct large coarse towels to be saturated with a solution of chloride of lime, and hung over the backs of chairs, and a sheet to be hung in front of the bed-room door. We may judge of the quantity required for disinfecting the room by smell and taste on going into it. This process should be continued throughout the course of the fever. (Dr. P. Hood, p. 23.)

The stomach having been relieved by vomiting, whether by the operation of nature or art, and the liver and bowels also by the administration of an efficient dose of medicine, *quinine* is our sheet-anchor. This drug is as powerful in destroying the scarlatinal germ as it is potent in the cure of ague. It should be given in doses of a grain and a half, to a child eight years of age, with a few drops of sulphuric acid and syrup of orange peel, in water. The dose may be repeated about every six hours. The pulse will

be found to diminish in frequency, and the soreness of throat and difficulty of swallowing to be scarcely complained of. In the worst forms of the disease, iron should be combined with the quinine. When this treatment is pursued, it is necessary that strict attention should be paid to procuring a daily alvine evacuation. (Dr. P. Hood, p. 23.)

Digitalis.—For some years it has been the custom of the author to prescribe digitalis in cases of scarlet fever, combining it usually with nitric ether and nitrate of potash. It controls vascular action and lowers the frequency of the pulse. One drop of the tincture every three or four hours should be given to a child a month old, though as much as five drops is tolerated. (Dr. S. Fennell, p. 25.)

Carbolic Acid in Scarlatina, Measles, and Small-pox.—The author has given carbolic acid internally in six hundred cases of the above-named diseases. He usually gives a tablespoonful of the following mixture every four hours, until the fever, &c., has subsided. Carbolic acid and acetic acid, of each one drachm to one drachm and a half; tincture of opium, one drachm; chloric ether, one drachm; water, to eight ounces. It produces profuse perspiration, and rapidly lowers the pulse, so much so, that in twenty-four hours it will fall from 120 to 60; skin cool and moist, with subsidence of fever. (Dr. A. Keith, p. 26.)

Scurvy.—Sea-scurvy is not owing to a deficiency of potash in the food, but is caused by mal-nutrition owing to the indigestible character of the food. Salt meat and dry biscuit will remain undigested for five or six hours, hence the digestive powers become exhausted, and the gastric juice deficient in quality. Lemon juice, lime juice, wines, all kinds of vegetables, act as anti-scorbutics, as does nearly every nameable article of diet, but this is on account of the variety of food. The acid fluids, such as lime and lemon juice, also act by assisting the digestion of the fibrine of meat. The great desideratum should be that the sailor should be provided with good flesh-food; and since salt meat must of necessity always form the basis of his dietary, every care should be taken that it be of recent pickle, bad salt-meat being too commonly the cause of the disorder. (Dr. A. Farr, p. 40)

Struma.—*Peroxide of Hydrogen.*—The author has administered peroxide of hydrogen in various diseases, such as diabetes, rheumatism, cardiac diseases, and struma. The results in the two cases of struma related were encouraging. In both cases there was great enlargement of the cervical glands, and in both, the swelling rapidly disappeared. A third case had suppurating glands in the neck, and purulent discharge from abscesses in six other parts of the body. This case, also, rapidly recovered. (Dr. B. W. Richardson, p. 234.)

AFFECTIONS OF THE NERVOUS SYSTEM.

Chorea.—The red oxide of iron is one of our best remedies in chorea. It was first given by Dr. Elliotson many years ago, and he acquired great fame by his success. An equally favourite remedy at Guy's Hospital is sulphate of zinc, beginning with grain doses, and increasing gradually. A favourite remedy of the late Dr. Hughes was rhubarb steeped in port wine; the children were thus well kept up at the same time that the stomach and bowels were improved in condition. (Dr. S. Wilks, p. 65.)

Indian Hemp.—Indian hemp has a peculiar value and power in controlling the irregular movements of chorea. Small doses frequently repeated are more suitable than larger ones at longer intervals. Six minims every hour was given in the case of a child thirteen years of age. (Dr. Douglas, p. 67.)

Cruveilhier's Paralysis.—*Electricity.*—Cruveilhier's paralysis is only another name for "progressive muscular atrophy" and "wasting palsy." It occurs always in the muscles of the upper extremity. It may be diagnosed from paralysis produced by lead in the system by the fact that in the latter the muscles do not respond to the stimulus of electricity, whereas in progressive muscular atrophy they do. There can be no doubt that the best and

perhaps only treatment for this disease is electricity. Remak's method, although quite empirical, is perhaps the best. This consists in the employment of a "constant" battery, having 100 cells, of which a variable number are used according to circumstances. The positive pole is applied to the back of the head or neck, the other or negative pole is placed over the spine, below the fifth cervical vertebra. (Dr. C. H. Fagge, p. 72.)

INSOMNIA.—If sleeplessness arises from pain, opium is our remedy; if, however, from mental rather than from physical pain, or from trifling causes exciting a morbidly sensitive nervous system, bromide of potassium or ammonium is more appropriate. In the latter class of cases opium will frequently aggravate the insomnolency. To adults a dose of thirty grains of bromide should be given a quarter of an hour before the last meal, and a second dose of from twenty to fifty at bed-time. In cases in which, without any nervous complaint, there is sleeplessness owing to some cause of cerebral excitement, sleep is almost always induced by that remedy. (Dr. James Turnbull, p. 53.)

MIGRAINE AND CLAVUS HYSTERICUS.—*Muriate of Ammonia.*—Migraine is one-sided headache, which if it lasts long enough ends in vomiting. Both this affection and clavus hystericus are primary neuralgias of the fifth cranial nerve. Salts of ammonia, as being diffusible stimuli, naturally suggest themselves as likely to cut short attacks of these kinds. The muriate of ammonia in doses of ten to twenty grains is very effective, and if given early enough seldom fails to cut short or greatly mitigate an attack. (Dr. Anstie, p. 49.)

MYALGIA.—*Muriate of Ammonia.*—The general type of cases of myalgia (so named by Dr. Inman of Liverpool) is that of aching pains felt in muscles which are habitually overworked in proportion to their nutrition; such pains are naturally commonest in laborious and ill-fed persons. Theoretically rest is the one all-paramount indication of treatment; but practically this is often found to be impossible. Dr. Anstie, from whose paper these remarks are abstracted, observes of the action of muriate of ammonia in these cases, "I give it in doses varying from ten to twenty grains, and can say that not even quinine in ague is a more reliable agent than the muriate in myalgia." (Dr. F. E. Anstie, p. 48.)

NEURALGIA.—*Sulphate of Nickel.*—A case of obstinate neuralgia is related which was cured by sulphate of nickel in doses of half a grain, three times a day. At the end of a week, a dose of one grain was given. "Its sedative action was speedily manifested in reducing the pulse and procuring sleep. All symptoms of the paroxysm disappeared." The remedy seems worth a trial. (p. 58)

Intercostal Neuralgia.—Intercostal neuralgias and myalgias which are so common in suckling women, are generally much benefitted by the administration of muriate of ammonia. (Dr. F. E. Anstie, p. 50.)

Neuralgias of the Viscera.—There can be no doubt that neuralgia attacks internal organs—such as the heart, the liver, the stomach, and the ovary. Hepatic neuralgia is not uncommon. The pain complained of is severe and intermittent, and unaccompanied with symptoms indicating inflammatory action or any organic change. Nothing is more obstinate than such a case. Quinine and arsenic are useless, or even ill borne. But here the muriate of ammonia, in ten or fifteen grain doses acts "like a charm," cutting short the attack promptly, and also seeming to dissipate the tendency to neuralgia. (Dr. Anstie, p. 51.)

Facial Neuralgia.—Spasmodic or "Epileptiform."—There is a form of facial neuralgia, which, when it occurs, does so in persons past the prime of life. It is characterised by intense severity in its onset, which is also sudden. It is to some extent hereditary. Our best treatment consists in: 1. The use of counter-irritation of a peculiar kind. 2. Nutritive tonics. 3. Subcutaneous injection of morphia, or of atropia according to circumstances. The counter-irritation must not be applied to the branches of the fifth nerve, but to those of the occipital nerve. A blister at the nape of the neck is often strikingly effective in gaining a short respite. The assiduous use of

cod-liver oil, or of some fatty substitute for it, should be insisted on from the first, and is of the highest consequence. (Dr. F. E. Anstie, p. 62.)

PAIN IN THE PELVIC VISCERA.—Belladonna is incomparably the best of all medicinal remedies for every kind of pain in the pelvic viscera, nothing can approach it in this respect. (Dr. Anstie, p. 100.)

STOMACHAL EPILEPSY.—*Brucine.*—Brucine is a tonic of great value in cases of epilepsy. Convulsion is an impossibility in a perfectly healthy brain and nervous system. It should be given in a solution made of the same strength as the liquor strychniæ of the Pharmacopœia, of which ten minims twice daily is a commencing dose. Every third day an addition should be made of five minims to the dose until from a third to half a grain is reached. The action of brucine is very similar to that of strychnine, but it is preferable in these cases. No benefit must be expected until a full dose is reached. The administration of brucine need not interfere with our using the bromides in suitable cases. (Dr. J. S. Ramskill, p. 63.)

STRYCHNIA POISONING.—*Calabar Bean.*—A case of strychnia poisoning is reported in which, after half an-ounce of the tincture of calabar bean had been given in small and repeated doses, the report was: "The pulse then became extremely weak, the spasms almost ceased, but the woman could hardly speak or swallow." She gradually recovered from this state of depression. (Dr. J. W. Keyworth, p. 71.)

Subcutaneous Injection of Morphia.—When the patient is tetanic and unable to swallow anything, face congested and livid from the violence of the spasms, and the consequent asphyxia, remedies administered by the stomach are out of the question, and chloroform is of doubtful efficacy. In such cases inject a third of a grain of morphia subcutaneously, and repeat it, if necessary, in three-quarters of an hour, and again in two hours more. A most interesting case illustrating the satisfactory results of this plan of treatment, is related in the article from which this note is taken. (Dr. C. Puzey, p. 238.)

TETANUS.—*Calabar Bean.*—Calabar bean continues to be found efficacious in the treatment of tetanus. Its exhibition should be commenced early, so as to give it time to act before the disease has become matured. Cases are related by Mr. W. Alexander (p. 67), Dr. Eben. Watson (p. 69), and Dr. Macarthur (p. 252).

Bromide of Potassium.—A case of tetanus is also related by Mr Brown, which was treated by bromide of potassium, given in doses of twenty grains every hour. It terminated favourably, but it is difficult to judge of the value of a remedy from one case. (p. 250.)

AFFECTIONS OF THE CIRCULATORY SYSTEM.

BLOODVESSELS.—*Action of the Sympathetic Nerve on.*—The attention of physiologists is being much directed to the action of the sympathetic on the bloodvessels. Dilatation of the vessels and increased temperature, or diminution of temperature, with final atrophy, are now well known to result from experiments made on these nerves. (Dr. S. Wilks, p. 34.)

EPISTAXIS.—*Perchloride of Iron Spray.*—In desperate cases where plugging has not arrested the hemorrhage, or when that remedy is not thought desirable, try the plan of blowing up the nostril the spray of tincture of perchloride of iron. If it is desirable that it should pass backwards further than the soft palate, the opposite nostril and the mouth must be kept firmly closed during the operation. (Mr. W. M. Banks and Dr. Cregeen, p. 147.)

INFLAMMATION.—*Opium.*—Opium is the most important anti-inflammatory remedy at present known. It never could have maintained its position as a medicine in all forms of inflammation, unless this had been its true nature. Its effects are most striking in the various forms of inflammation of the abdomen and chest. How a sore throat or bad cold can be at once

checked by a Dover's powder, or a dose of laudanum, is in every one's experience. (Dr. S. Wilks, p. 35.)

Aconite.—The power of aconite over inflammation is little less than marvellous, especially in the early stages. It can sometimes at once cut short the inflammation. As might be expected, the results of aconite are most apparent when the inflammation is not extensive, or not very severe, as in the catarrh of children, or in tonsillitis, or in acute sore throat. The chief symptoms produced are moisture of the skin, and lowering of the temperature, and of the frequency of the pulse. Half-a-drop of the tincture, or a drop, in a teaspoonful of water, should be given every ten minutes or a quarter of an hour, for two hours, and afterwards be continued every hour. If there be much prostration, a still smaller dose should be given. (Dr. S. Ringer, p. 236.)

Popliteal Aneurism.—There is no simpler and more effectual way of curing this disease than the following:—Confine the patient to bed with the knee on a pillow, and moderately bent, and let him take half-a-drachm to a drachm of iodide of potassium daily. By some such means as Carte's circular compressor, with the screw pad removed, suspend over the artery in the femoral space a weight of about twelve lbs. This may be a long circular bag containing shot, and the artery is to be compressed by the lower end of the bag. The lower extremity of the weight should be a curve of the form of the larger end of an egg turned from a mass of lead 3¼ inches in its transverse diameter. If more pointed it becomes intolerable. If the circulation in the artery is kept completely arrested for twenty-four hours, which it may readily be by constantly watching the weight day and night, and judging of its compressing effects by the hand placed on the tumour, the sac will be found to have solidified. It will be well, however, to maintain the pressure for twenty-four hours longer. (Dr. P. Heron Watson, Edinburgh Medical Journal, May, 1869, p. 961.)

Torsion of Arteries.—When torsion of a large artery is properly done the internal and middle coats give way and retract in the direction opposed to the blood stream, approximate and overlap, and occasionally the ends become actually incurved. The twist of the external coat remains permanent. If this experiment be done on an artery just removed from an animal it will be found that water cannot be forced through the obstruction by means of a syringe acting in the direction of the blood stream. This shows, as also to direct experiments on the carotid of the horse, that torsion is applicable to arteries of the largest size. The extremity of the artery held by the forceps should not be twisted off, the occlusion of the artery is then much less secure. (Mr. T. Bryant, p. 115.)

The author has for some time used torsion exclusively in large operations—in amputations of the thigh, twisting the femoral as well as other arteries. The wounds were closed by sutures, and there was no after-hæmorrhage in any of the cases. The plan pursued has been to twist the end of the vessel until it fairly comes off. Care must be taken that the end is not pulled off, it must be twisted off. (Dr. G. M. Humphry, p. 121.)

AFFECTIONS OF THE RESPIRATORY SYSTEM.

Asthma.—*Belladonna.*—Belladonna is one of the most efficient remedies for asthma. But there are certain points to be observed in its administration. The tincture is the best preparation, and it must be given only once a day, viz., at night. The object of this is to bring the full force of the drug to bear upon the disease at the time at which it is most liable to come on, and moreover a larger dose can be given than when it is oftener repeated. Ten minims is the commencing dose, and it must be gradually increased up to twenty, thirty, or forty minims, as necessary. It has hitherto not been prescribed in sufficient doses, and this accounts for its failure in the hands of many who have tried it. (Dr. H. Salter, p. 89.)

Spasmodic Asthma of Children.—Bromide of potassium in six grain doses in syrup every two hours is worth a trial in this affection. (Dr. W. Begbie, M. Sondahl, p. 91.)

CHRONIC CATARRH.—Give five minim doses of tincture of aconite every four hours. Opium has a similar action in such cases. (Dr. S. Wilks, p. 38.)

IMPACTED FOREIGN BODIES IN THE NOSE.—Wash the foreign body out from behind by inserting the nozzle of a Higginson's syringe, or of Thudichum's apparatus, into the opposite nostril, and causing a stream of water to flow *out* of the nostril containing the foreign body. (Mr. W. M. Banks, p. 260.)

OZÆNA.—*Carbolic Acid.*—Perhaps carbolic acid is the best deodorant in cases of ozæna, certainly one of the best. A solution of this can easily be run through the nostril by means of a piece of elastic tubing, having a perforated weight at one end and a nozzle to accurately fit the nostril at the other. This must be used as a syphon, the vessel containing the solution being placed on something above the elevation of the patient's head. It will now be found that if the nozzle be placed in the nostril which is unaffected, and the stream allowed to flow, at first gently, that it will cause the soft palate to rise upwards and completely shut off the nasal from the pharyngeal cavity. The course of the stream will be round the septum and out at the diseased nostril, which is thus thoroughly cleansed and disinfected. It is well to use tepid salt and water occasionally as well as carbolic acid. (Mr. W. M. Banks, p. 145.)

PHTHISIS.—*Ether and Etherized Cod Liver-Oil.*—It was found by M. Claude Bernard that ether introduced into the stomach of an animal determines soon afterwards a considerable flow of pancreatic juice. The author proposes to take advantage of this in the treatment of phthisis, for the effect of the ether is to cause turgescence of the pancreas and of the intestinal glands exactly as occurs in a healthy person during the digestion of food, so we may hope to stimulate the gland to renew their healthy action. Pure ether of the Pharmacopœia should be used, and may be given in twenty minim doses mixed with two drachms of cod-liver oil three times a day. The ether very much disguises the taste of the oil. (Dr. B. W. Forster, p. 84.)

TRACHEOTOMY TUBES.—The tracheotomy tubes usually constructed are not sufficiently long to reach the treachea easily in the living subject, and the consequence is that they occasionally slip out during the act of coughing or swallowing, and if the surgeon is not at hand, death may ensue. The tubes should be made half as long again as those ordinarily employed. The two blades of the outer canula should be made so that they lie in close apposition at their distal extremities, and are separated only by the introduction between them of the inner canula. The introduction of the canula through the slit in the trachea is much facilitated by this plan. (Mr. T. R. Jessop, p. 153.)

Mr. Durham, of Guy's Hospital, has invented a form of tracheotomy tube which certainly may be considered an improvement on those in general use. The collar is movable, and can be fixed at any point of the straight part of the outer tube. The portion of the tube in the wound may thus be regulated in length according to the depth at which the trachea is situated. The inner tube is longer than the outer one, and the terminal or curved portion consists of several small pieces jointed together, somewhat in "lobster-tail" fashion. This is necessary in order to enable the tube to pass along the straight portion of the outer tube and then to curve downwards, and fit into the perpendicular portion. In order to facilitate the introduction of the outer tube it is mounted on a blunt-pointed pilot trocar, which is withdrawn when the tube is introduced. (Mr. A. E. Durham, p. 146.)

AFFECTIONS OF THE DIGESTIVE SYSTEM.

CLEFT PALATE.—*Instrument for facilitating the Operation of Staphyloraphy.*—The desirability of performing the operation for cleft palate at an earlier age than has hitherto been done cannot be denied. The author has invented an instrument by which the patient is rendered perfectly helpless, the tongue being depressed and the mouth held wide open. By this means, and by the aid of chloroform, the defective formation may be remedied early in life, before the indistinct and nasal habit of speaking becomes permanently acquired. The same instrument will be found useful in excision of the tonsils in unruly children, and in operations on the pharynx and interior of the mouth. (Mr. T. Smith, p. 159.)

HARE-LIP.—Cases of hare-lip ought to be operated upon within the first month; nothing is gained by waiting. If this is not done the child fails to take sufficient food, and becomes emaciated and unfit for the operation. The best position for the operator is sitting, the head of the child being held between the knees, while the rest of the body is supported by an assistant. Use a narrow scalpel, with which transfix above and cut downwards in a curved direction, that when the two curved surfaces are brought together the full edge of the lip may be thrown sufficiently down. If the alveolar process is cleft and prominent it should now be snipt through at the spot between the lateral incisor tooth and the canine, and pushed back. Having done this the lip and all the surrounding parts, including the nose, must be separated from the deeper parts, so that the lip may hang loosely, without any tension. If this is not well done there will be failure in the union. The raw edges of the wound must now be adjusted, commencing the adaptation at the lowest part. The sutures and pins are generally removed too early. (Mr. H. Walton, p. 157.)

New Operation for.—The author describes a new operation for the remedy of this deformity. The peculiar object of this operation is the preservation of the natural curves of the lip. The upper lip may be divided into a central and two lateral portions, divided by curved lines running from the nostril to the margin of the lip. The fissures of hare-lip always correspond to this division, and the cicatrices should also do so. (Dr. M. H. Collis, p. 154.)

HABITUAL CONSTIPATION.—In habitual constipation, ten or even five minims of tincture of colocynth in a little water an hour before breakfast generally suffices to insure a full evacuation, without much inconvenience, or the dose requiring to be increased. It is much superior to the crude colocynth. (Dr. R. W. Crighton, p. 231.)

HEMORRHOIDS.—*Use of the Ether-Spray in Operations on.*—A strictly external pile may be painlessly removed by freezing with ether-spray and then cutting it away with the scissors. When the hemorrhoids are close to the anus and extremely painful, it is an excellent plan to freeze them by the ether-spray and then remove them by the knife. It sometimes suffices to freeze them only, great relief being obtained and withering of them may follow without any operation whatever. When the mass is larger, and involving not only the external but also some of the internal veins, the whole mass having been moderately extruded, should be completely frozen. Long hare-lip pins should then be run through the base, and ligatures twisted round the mass sufficiently tightly to restrain hemorrhage but not to produce strangulation. The frozen piles may then be removed by the scalpel or scissors, the patient scarcely feeling the incisions. In twenty-four hours the needles and ligatures can be removed. Hemorrhoids strictly internal are best treated by acids or the cautery. (Mr. H. Coote, p. 164.)

STRANGULATED HERNIA.—*Opening the Sac.*—The sac of a strangulated hernia is nearly always opened at St. George's Hospital. One reason for this is, that the fluid contents of the sac (if this be not opened) are returned together with the intestine into the abdomen. These contents consist often of

lymph, blood, and serum, in which various alterations are taking place. (Mr. H. Lee, p. 164.)

Coffee in Strangulated Hernia.—In Havana, coffee has from time immemorial been employed for the reduction of hernias. It is to be used thus:—Add half a pound of powdered roasted coffee to twelve cupfuls of boiling water, and of this let a cup be taken every quarter of an hour till eight cups are taken, after which half an hour should elapse between each dose. Spontaneous reduction of the hernia will generally take place before the coffee is finished. (Dr. Marchand, M. Durand, p. 163.)

AFFECTIONS OF THE URINARY ORGANS.

DIABETES.—*Peroxide of Hydrogen.*—Opinions differ as to the efficacy of peroxide of hydrogen in diabetes. A case is related in which under its use for two months the urine fell from eleven pints in the twenty-four hours to five, and the specific gravity from 1045 to 1024. (Dr. W. H. Day, p. 97.)

The author reports that he has tried both the aqueous and the etherial solution of peroxide of hydrogen in diabetes, but has not been able to perceive that the slightest benefit has been produced. He tried ozonic ether in another case and reports that "there was no marked effect either one way or the other observable upon the urine." (Dr. F. W. Pavy, p. 95.)

EXCESS OF UREA IN THE URINE IN CASES OF NERVOUSNESS AND DYSPEPSIA.—Cases not uncommonly occur in which the symptoms complained of are nervousness and depression of spirits, indisposition for exertion whether mental or bodily, and dyspepsia, with irregularity of the bowels, acidity of stomach, and excessive flatus. In these cases, if nitric acid be added to the urine, to about one third of its amount, and the tube containing it to be put aside for twenty minutes or half-an hour, it will generally be found to become semi-solid from crystallized nitrate of urea. The disease is temporary, but is very liable to recur, is almost always in males, and is in some way associated or allied with gout. (Dr. H. W. Fuller, p. 91.)

SCARLATINAL ALBUMINURIA.—After scarlet fever, the access of inflammation of the kidneys is indicated at once by a rise in the temperature of the body. The friends should be directed to observe the temperature of the body night and morning; and if this should rise beyond the limits of health, they should at once commence the administration of aconite in doses of half a drop to a drop of the tincture every quarter of an hour for the first two hours, and then every hour. The disease may thus be at once cut short. (Dr. S. Ringer, p. 237.)

STRICTURE OF THE URETHRA.—*Bougies with Bulbous Points.*—Bougies having constricted necks terminating in a bulbous point are of great value in the treatment of stricture. The flexibility of the constricted neck facilitates their adaptation to the urethral curves, and the conical shape of the shaft promotes the process of dilatation. (Dr. F. J. Bumstead, p. 166.)

Filiform Bougies.—"Filiform bougies" the point of which is even smaller than one-third of a millimetre in diameter, (No. 1 of the French scale) are indispensable in the treatment of tight stricture. The surgeon provided only with the ordinary instrument will find many strictures "impassable," which can readily be passed with smaller instruments, and in cases of retention of urine, will be tempted to resort to puncture of the bladder. (Dr. F. J. Bumstead, p. 166.)

Holt's Dilator.—Holt's dilator has a great defect in this, that the point is so large that considerable dilatation is often necessary before it can be brought to bear on the stricture. To obviate this it is recommended that the point should be made separate, so that it can be unscrewed, and in its place a filiform bougie attached. By this plan the instrument may, with a little time and patience, be inserted to the requisite extent in any case of stricture which is at all passable, and at a single sitting. (Dr. F. J. Bumstead, p. 167.)

Spasmodic Stricture.—Spasmodic stricture sometime very closely resembles organic stricture in its symptoms. It is, however, only by want of care that errors in diagnosis can arise. Cases occur in which all the symptoms of stricture endure for years, but in which, nevertheless, there is clear evidence to show that it entirely depends on muscular contraction, unattended either by inflammation or congestion. In these cases it will be noticed that the gentlest introduction of an instrument causes acute pain, that the point is arrested at a variable distance, that sometimes to the patient's astonishment he is able to pass urine in a full stream, and that the state of the stricture varies with his general health. Chloroform is sometimes of great use in both the diagnosis and treatment of spasmodic stricture. Opium administered by the rectum, and belladonna locally applied, are sometimes useful, but especially the former. Rest, recumbency, and warmth, in the form of baths, are necessary. But in all these cases we must ascertain as far as possible, the cause of the affection and modify our treatment accordingly. (Mr. W. S. Savory, p. 170.)

Stricture and Irritable Bladder.—Belladonna is of great service as a local application to strictures of the urethra. It has a decided effect on cicatrices and growths of a fibrous character resembling them. A cicatrix becomes softer and more like the healthy skin around it, under the constant and continued application of belladonna. It may readily be applied to strictures by means of the oleum Theobroma as a vehicle. Two grains of the extract may be used in this way twice a day, in conjunction with the regular introduction of the metallic bougie in gradually increasing sizes. (Mr. R. Harrison, p. 99.)

DISEASES OF BONES AND JOINTS—FRACTURES, DISLOCATIONS, ETC.

COMPOUND FRACTURES.—*Antiseptic Treatment.*—The advantages of healing by scabbing are very great. For this purpose it is necessary that the deeper layers of the dressing should be left to form the scab, and while the antiseptic is renewed from time to time externally, it should not penetrate to the surface of the wound. Cover the wound with two or three thicknesses of lint soaked in carbolic acid in oil, and cover these with a piece of oil silk. The lint consolidates into a crust or scab by the action of the acid on the blood which soaks into the lint. The whole should then be covered with the antiseptic putty, which may be changed daily or once in two days, wi hout disturbing the lint. It is very important that the putty should overlap the permanent dressing well on all sides. (Prof. Lister, p. 108.)

Carbolic acid can be mixed with shell-lac in any amount by the aid of heat, and the result when cooled varies according to the quantity of the acid, from brittleness to fluidity, the intermediate proportion giving a firm but flexible solid, with considerable elasticity. The lac thus associated with carbolic acid retains it with great tenacity, so that a thin layer spread on calico forms an application which retains its virtues for days, at the temperature of the body, and at the same time does not irritate the skin. This substance forms an admirable substitute for the lint recommended for the formation of a scab in the treatment of compound fracture. The adhesiveness to the skin, which is its virtue in this case, is in other cases undesirable; this may be obviated by brushing it over lightly on the under surface with a weak solution of gutta percha in bisulphide of carbon. (Prof. Lister, p. 109.)

FRACTURE OF THE LEG.—The back splint should be very slightly curved for the calf of the leg, 3½ inches wide at the widest part, and two and a half at the ankle. There ought to be a hole for the heel, that sloughing of that part may not be caused by pressure. One of the worst results from fracture of the leg is inversion or eversion of the foot, so that the patient walks on the side of the foot instead of on the flat of it. Another unfortunate result

is rotation of the foot outwards, so that the patient afterwards walks with the toes rotated outwards instead of forwards. These accidents are easily avoidable by having a foot-piece, nearly at right-angles with the back-piece. To this the foot must be firmly bandaged, taking care that the three balls of the sole of the foot are all equally pressed against it. The back-piece is to be made of iron, and must have two short transverse bars projecting from its sides, and looped, to receive the slings. A cradle, two flat wooden side-splints, and pads stuffed with tow, complete the apparatus required. There should be no bandages surrounding the limb, so as to obscure our view of it, and moreover they are liable to cause œdema. (Prof. Paget, p. 137.)

LIGATURE OF ARTERIES ON THE ANTISEPTIC SYSTEM.—When catgut is kept steeped in a mixture of oil and carbolic acid, holding in solution a small quantity of water such as the acid enables the oil to dissolve, it becomes completely antiseptic, and when employed as a ligature to an artery may be safely left in the wound. the ends being cut off close. A simple solution of carbolic acid in oil will not do, for the gut remains quite rigid, the oil not entering at all into its substance, nor will a solution of acid in water answer the purpose, for the gut swells too much and becomes weakened. A vessel tied by this antiseptic ligature becomes permanently occluded by the internal and middle coats becoming blended together. But a most wonderful thing happens tothe bit of ligature—it becomes an organised and living structure, continuous with the external coat of the artery. (Prof. Lister, p. 101.)

PARTIAL ANCHYLOSIS.—If it cannot be determined that complete anchylosis has taken place, or whether the adhesions are fibrous, and if fibrous, whether they will yield to gradual extension or not, give chloroform, and these points can at once be satisfactorily determined. In cases of partial or fibrous anchylosis it is better to commence the treatment by dividing the tendons of rigid muscles, and by dividing subcutaneously cicatrices. Partial displacement of the articular surfaces is easily produced by continued extension without tenotomy. The tendons having been divided, if any displacement of the surfaces exist it must be remedied, and then gradual extension made by a properly fitting instrument. Numberless cases, however, exist in which the adhesions are so firm that they do not yield to gradual extension; in these chloroform must be given and the adhesions ruptured. The force applied for the purpose of rupturing adhesions must be applied in the direction of flexion, and the adhesions must be ruptured instantaneously. (Mr. B. E. Brodhurst, p. 127.)

REDUCTION OF OLD DISLOCATIONS.—Provided manipulations are employed in cases of old standing dislocations instead of the pulleys and physical force, reduction may be successfully accomplished at almost indefinite periods from the accident. If there is no attempt at repair of the injury in the new situation, and the limb is useless and painful, we are bound to attempt reduction. Chloroform is to be fully given, and then the head of the bone loosened from its attachments by moving and rotating it. Before this is done, in some cases it is well to divide any tendons which may be in the way of reduction. This is to be done subcutaneously and the punctures allowed to heal before the reduction is attempted. (Mr. B. E. Brodhurst, p. 131.)

REPRODUCTION OF BONE FROM PERIOSTEUM IN RESECTION OF JOINTS.—Experiments made by M. Ollier, of Lyons, conclusively establish the power of periosteum to reproduce bone. These experiments are of great importance as bearing on resection of joints. (p. 132.)

When the elbow joint is excised, the bones only being removed, and the periosteum left entire, it is a most singular and startling fact that reproduction of the bone takes place, the form of the original bone being preserved. A case is related in which both the condyles of the humerus and the olecranon process were reproduced. There was a regular joint, surrounded by a capsule and containing hyaline cartilage. The details of the operation are described. (Mr. T. Holmes, p. 129.)

SPRAINS.—*Compression.*—Plunge the injured joint, say the ankle, into

water as hot as can be borne, and keep it there for at least two hours, maintaining the temperature of the water by fresh quantities of the hot. Then having dried the part, strap it carefully with adhesive plaster from the toes to the middle of the calf, as tightly and equally as possible, using long strips an inch wide. Next day the plasters will be found quite loose from the shrinking of the limb, which is now generally almost free from pain. The plasters must be removed and fresh ones applied, and this must be repeated on the next day, and again after an interval of two days. It is seldom necessary to apply them more than this, as the patient is able to use his limb, and is free from pain. (Dr. C. H. Higgins, p. 122.)

VARUS.—The treatment of varus should not be delayed beyond one or two months from birth, as lapse of time only increases the difficulty of cure. As the distortion is a compound one, so its removal must be effected by various stages. It is better in every case to divide the three contracted tendons, viz., those of the tibialis anticus and tibialis posticus, and the tendo-Achillis. The tendons of the tibial muscles should be divided first, and the inversion of the foot overcome, before the tendo-Achillis is divided. (Mr. B. E. Brodhurst, p. 142.)

AFFECTIONS OF THE SKIN, ETC.

ARSENIC IN SKIN DISEASES.—Arsenic is adapted to the treatment of chronic diseases of the skin which are neither contagious nor specific, neither strumous nor cancerous. It is therefore necessary in six out of every seven cases of chronic skin disease which we are asked to relieve, and moreover these cases are curable by arsenic, and are absolutely incurable without it. If Fowler's solution is used, five minims should be given three times a day, after meals. It must be clearly understood by the patient that no results are to be expected for some time. If there is no improvement in a month, the dose must be slightly increased, and a slight increase may be made in the dose every three or four weeks, if necessary. If conjunctival inflammation of *both* eyes occurs, the dose may be reduced to four minims, but the medicine must not be abandoned in a panic. It must be distinctly understood by the patient that the medicine acts slowly, and it may require combination with other treatment, such as aperients, or iron. (Mr. T. Hunt, p. 246.)

DERMALGIA.—There are two forms of dermalgia, the hysteric and the rheumatic. By dermalgia is meant an increased sensibility to touch confined to a limited portion of skin. Often the pain is independent of contact with any sensible object. Blisters, the linimentum belladonnæ, and the valerianate of zinc or bromide of ammonium internally, are the most likely means of affording relief. Subcutaneous injection of morphia is sometimes called for. (Dr. H. S. Purdon, p. 57.)

CARBUNCLE.—"On a very strong impression, I say that carbuncles will spread after cutting in as large a proportion of cases as they will spread in without cutting." If they can be divided in the first three or four days whilst still hard and brawny, it may relieve some measure of the suffering; at a later period the incisions have no influence at all. Although abandoning the plan of crucial incisions of carbuncle, incisions *are* called for, if a portion of integument holds in and retains a slough or a quantity of matter, just the same as in an ordinary abscess. There is no good to be obtained by large feeding or abundant stimulants in ordinary cases of carbuncle; let the patient continue his ordinary mode of living. The importance of cleanliness is very great. Patients with carbuncle must not be shut up in their rooms, they should have plenty of free air. (Mr. J. Paget, p. 187.)

CONVERSION OF UPPER LAYER OF CUTICLE INTO LEATHER.—The application of a solution of tannin, of the strength of 600 grains to an ounce of water, to the skin, converts the upper layer of the cuticle into leather. It may be applied, according to circumstances, by a layer of lint saturated with the solution, or by means of a brush. The tannin combines chemically with the

gelatine of the skin, forming a contracted impermeable layer of tannate of gelatine; it, in short, tans, or converts into leather the superficial layer of the cuticle. This may be made use of in many cases, as in the treatment of skin affections which depend on a local cause. It may also be found useful in checking and preventing unhealthy local sweatings, and in various other affections in which gentle and uniform pressure is required. (Mr. J. Martin, p. 230.)

ERYSIPELATOUS INFLAMMATION.—*To apply Nitrate of Silver.*—Unless nitrate of silver is properly applied it is liable to be unsuccessful. The parts should be carefully washed with soap and water, and afterwards with water alone, and then wiped dry with a soft towel. A concentrated solution of four scruples of the nitrate to four drachms of distilled water is then to be applied two or three times on the inflamed surface and beyond it, on the healthy skin, to the extent of two or three inches. Care must be taken that no part is left untouched. In twelve hours, if any inflamed part be unaffected, the solution must be immediately reapplied. (Mr. J. Higginbottom, p. 184.)

HERPES ZOSTER.—Mr. Jonathan Hutchinson gives some interesting cases showing that herpes zoster is liable to occur, as a result of the therapeutical administration of arsenic. (p. 186.)

ITCH.—Except sulphur is used properly in itch it is productive rather of harm than good. In recent cases we should apply the sulphur freely to the interdigits and wrists only, and apply soothing remedies to the general surface, because the eruption on the general surface is sympathetic, the acari existing only about the hands and wrists. The sulphur is generally used a great deal too strong, one part to sixteen is quite strong enough. It is very commonly the case that the scabies is cured by the use of sulphur, but the secondary eruption is intensified. In such cases it is necessary to abandon all sulphur treatment, to give a bran-bath, and use freely some soothing lotion, and the patient soon gets well. (Dr. T. Fox, p. 184.)

LIPOMA NASI.—In cases of large, overgrown, knobby, purple noses, shave the overgrowth down with the knife until the fibro-cartilages are seen. There is usually very free hemorrhage, which is easily checked by pressure and ice. The wound should be dressed with cerate. A smooth even scar will result, much more sightly than the previous diseased state. (Mr. J. Hulke, p. 245.)

VENEREAL AFFECTIONS.

CHRONIC GONORRHŒA.—*Glycerine of Tannin.*—The following injection is of great service in cases of gleet and chronic gonorrhœa:—Glycerine of tannin, three ounces; olive oil and mucilage, of each one ounce. If used in the acute stage of the disease it should be diluted with equal parts of mucilage. (Mr. J. D. Hill, p. 192.)

HERPES ZOSTER, (*sometimes Syphilitic.*) In syphilitic herpes zoster the patches are located exactly as are those of common herpes zoster, and are as clearly under the influence of nerve distribution. But these cases differ from the common herpes zoster in that the eruption is usually on both sides of the trunk and on other parts of the body. It may also last much longer than common herpes zoster does. (Mr. J. Hutchinson, p. 186.)

AFFECTIONS OF THE EYE AND EAR.

DEAFNESS.—*Politzer's Method of Injecting Air into the Eustachian Tubes.*—During the act of swallowing the tensor palati muscle is put upon the stretch, and opens the Eustachian tube. M. Politzer taking advantage of this instructs the patient to swallow, and during the act forcibly injects air into the nose by means of an india-rubber bag, the opposite nostril to that

into which the nozzle of the bag is introduced being firmly closed at the same time. This answers perfectly when there is perfect accord in time between the operator and the patient, sometimes however this is not the case. To meet this objection the author has introduced a modification of the plan, by which the patient injects the air himself. (Dr. J. Brunton, p. 182.)

LACRYMAL OBSTRUCTION.—*Stricture of the Nasal Duct.*—Dr. Stilling, of Hesse Cassel, has introduced the plan of treating stricture of the nasal duct by internal incision, and the results have so far been very satisfactory. He uses a knife resembling a small tenotome, rounded at the point, with a sharp cutting edge and rounded back, the blade about three-quarters of an inch long, rather wider at the heel than at the point, and inserted into an ivory handle by a steel stem, of such length, that the handle is above the canaliculus when the point rests on the floor of the nose. The resisting structures should be fully divided in three or four directions, until the blade is felt to be free in the duct. (Dr. Stilling, Mr. R. B. Carter, p. 177.)

ORBITAL CANCER.—After excision of cancer the advantages derivable from the application of chloride of zinc must not be forgotten. Two cases are related of orbital cancer treated by this plan. In the first the disease had not returned after a period of three years. The chloride of zinc paste was laid on small pieces of lint, and applied to the whole surface of the wounds. (Mr. G. Lawson, p. 180.)

MIDWIFERY, ETC.,

ACCIDENTAL HEMORRHAGE AND PLACENTA PRÆVIA.—*Diagnosis between.*—The blood in placenta prævia comes directly from the uterine or placental vessels, or both, into the vagina, and is there discharged as blood, leaving coagulations behind in the vagina; whereas, in accidental hemorrhage, the blood, before being discharged, having to find its way some distance to the os, deposits its fibrine so that coagulation does not occur in the vagina, which is free from clots. (Dr. E. Calthorp, p. 198.)

ANTISEPTIC SPONGE TENTS.—Cut the sponge when wet into the exact shape and size preferred, and saturate it with gum mucilage in which ten or twelve grains of crystallized carbolic acid has been dissolved, to the ounce of mucilage. The tent should then be wrapped on an awl, with a strong, coarse, well-twisted cord, beginning at the small end and carrying the cord round the sponge with perfect regularity. When dry and the cord has been removed the screw threads should not be smoothed down, as they not only prevent its slipping out, but facilitate its introduction, for if there is a hitch during the introduction the tent may be used as a screw. To introduce it hold the uterus by a hook attached to the posterior lip, and pass the tent up by means of a pair of small straight forceps. (Dr. G. S. Bryant, p. 216.)

INDUCTION OF PREMATURE LABOUR.—Having determined the day for the operation, in the evening pass a No. 8 or 9 elastic bougie into the uterus as far as it will easily slip in and twist the rest of the bougie up into the vagina; this keeps it *in situ*. By next day it will usually be found that some degree of preparatory action has been effected, and if this should merge by the afternoon into active labour the bougie may be withdrawn. In the further progress of the case it is not desirable to leave it to nature unless the pelvis is normal, and the labour has been induced on account of constitutional disease. In other cases it is desirable to accelerate the progress by the use of the caoutchouc dilators. If this plan is not followed the child is liable to be expelled suddenly in the absence of the medical man, and it frequently assumes an unfavourable position or the cord falls through, owing to the excess of liquor amnii generally present, and this in the absence of the attendant is likely to be fatal to the child. (Dr. R. Barnes, p. 195.)

The induction of premature labour by injection of water into the uterus is fraught with extreme danger. Both in this country and abroad several cases of severe shock and of sudden death have been caused by it. (Dr. R. Barnes, p. 194.)

INFLAMMATION OF THE BREAST SIMULATING CANCER.—There not unfrequently occur cases of inflammation of the breast the diagnosis of which from cancer is extremely difficult. There may be a hard, doubtfully elastic swelling, with retracted nipple, no external sign of inflammation and no increase of heat. The nipple may be drawn in out of sight. In the diagnosis, a careful inquiry into the history of the case is important, and no opinion should be given until an exploratory puncture has been made. (Mr. T. Bryant, p. 223.)

INTRA-UTERINE POLYPI.—The first thing necessary is of course to dilate the os and cervix uteri, so that the finger may explore the cavity of the womb. This is easily effected at one sitting, and without the fœtor caused by the use of sponge, by means of a number of sea-tangle tents, used as follows: A No. 5 or 6 sea-tangle bougie is cut into pieces a little longer than the uterine cavity, and the ends rounded off and smoothed. The patient having been put into the semi-prone position, and a duck-bill speculum introduced, the anterior lip of the uterus is to be seized with a fine tenaculum and drawn downwards, and the pieces of taugle introduced one after another, so as to pack the cervix uteri with them. No force must be used in introducing them. The tents should not actually touch the fundus of the uterus, but nearly so. The introduction of a number of small tents is much easier than that of one large one, and the dilatation effected is more satisfactory. The polypus may then be seized with a vulsellum forceps, and the loop of a single wire ecraseur being passed over it, it can easily be removed. It is not at all necessary that the tumor should be cut off close to its uterine attachment. (Dr. G. H. Kidd, p. 205.)

MEDICATED PESSARIES.—Cocoa butter is not a suitable vehicle for drugs intended to be administered in a pessary; for, independently of its causing an unpleasant greasy discharge from the vagina, it prevents the absorptive action of the vaginal walls acting on the drug used. An excellent vehicle is three parts of the soft soap of the B. P. to one part of powdered althea root. Pessaries prepared with this have a pleasant emollient action which is very grateful when anodynes are required. (Dr. A. Meadows, p. 218.)

NEW DUCK-BILL SPECULUM FOR PRIVATE PRACTICE.—The advantages of Sims's duck-bill speculum are very manifest in all vaginal and uterine operations. The ordinary specula push the uterus away, and are of little service beyond affording an excellent view of the os and lips of the uterus, and of allowing the easy application of caustics or other remedies to these parts. They are of no use in operations on the vagina. There are, however, insuperable objections to Sims's speculum in private practice, such as its unwieldly size, and its requiring an assistant. Dr. Nott, of New York, describes a speculum invented by himself, which combines all the advantages of Sims's, with the portability of other specula. Like Sims's it admits of the uterus being hooked down to the orifice of the vagina if necessary. It is self-retaining, thus leaving both hands at liberty, and does not require the help of an assistant. It will be best understood by reference to the woodcuts at page 222. (Dr. J. C. Nott, p. 219.)

OVARIOTOMY.—*The Clamp.*—During the twelve months, ending last October, Mr. S. Wells operated on thirty six cases of ovariotomy. In thirty of these he used the clamp, *and all recovered;* in the remaining six, other means were employed, and of these cases five died. Of these five, however, two would probably have died whatever mode of arresting hemorrhage from the pedicle had been employed. Still the superiority of the clamp seems sufficiently attested. It was not employed in all the cases, because in some the pedicle was too short. (Mr. T. S. Wells, p. 209.)

POST-PARTUM HEMORRHAGE.—In a case of very severe post-partum hemorrhage, in which no contraction whatever of the uterus could be obtained, and it was evident that death would soon ensue, the author pursued the following plan with success: He took a large sponge, and having washed it in cold water, squeezed it as much as possible, and introduced it into the womb; contraction immediately took place round the sponge, and a bandage having been applied over the abdomen the hemorrhage ceased. In about three days

it was expelled into the vagina, whence it was withdrawn by a string which had been tied to it previously to its introduction. (Dr. F. E. Wilkinson, p. 199.)

Injection of Perchloride of Iron.—In desperate cases of post-partum hemorrhage, where kneading, compression, ergot, cold in every form, have failed, there is no better plan of treatment than that of injecting the uterus with a solution of perchloride of iron. A very convenient preparation is the liquor ferri perchloridi fortiori of the British Pharmacopœia. Half a pint of this should be diluted with a pint and a half of boiling water and put into a deep small basin. It must be injected into the uterus by means of a syringe and a uterine tube about nine inches long. The author says, "I have hardly ever known any more hemorrhage to occur after one injection." (Dr. R. Barnes, p. 200.)

Prolapsus Uteri.—*Operation.*—A case of prolapsus uteri was lately operated upon successfully at the Middlesex Hospital in this manner: An elliptical piece of the mucous membrane of the vagina about three inches and a half in length by two in breadth, from the vesical wall of the vagina. The cut margins were brought together by means of two silver wire sutures. Fourteen days afterwards rather more than an inch of the mucous membrane of the posterior and lateral walls of the vagina, including the cutaneous margin of the fourchette, was removed by a horse-shoe shaped incision. The denuded surfaces were brought together by quilled sutures, as in operation for ruptured perineum. (Mr. Norton, p. 204.)

Sickness of Pregnancy.—*Carbolic Acid.*—Give drop-doses of the crystallized carbolic acid, liquefied by heat, and diffused in half an ounce of thin mucilage, three times a day. It will be found to act very satisfactorily, not only in the sickness of pregnancy, but in chronic cases of vomiting unconnected with pregnancy. (Mr. E. Garraway, p. 198.)

Hypodermic Injection of Morphia.—In intractable cases of vomiting of pregnancy inject morphia subcutaneously. A most interesting case illustrating the benefit of this plan of treatment is given. (Mr. J. Harrison, p. 255.)

Uterine Speculum.—*Reflecting Mirror.*—Dr. Sedgwick recommends as an improvement on the uterine speculum, the adaptation to it of a reflecting mirror about three inches and a half in diameter, and of five inches focal length. This is attached to the speculum by a jointed arm. The advantages of this are, the light can be concentrated on the part to be examined without much alteration of the patient's position in bed, and the illumination obtained is itself better. It was made by Weiss and Son. (Dr. L. W. Sedgwick, p. 248.)

Vesico-Vaginal Fistula.—The author proposes the plan of splitting the edges of the fistulous opening, so as to form two flaps, one vesical and the other vaginal. When the edges are brought together the split edges open out, and apply themselves against each other, giving a wide surface of contact. The edges are to be brought together with quill sutures. It is always necessary that the incision of the margins should pass well through any tough cicatricial tissue and reach sound areolar tissue. (Dr. M. H. Collis, p. 215.)

MISCELLANEA.

Artificial Respiration.—One of the convenient galvanic batteries now made by Stöhrer and others should always be at hand when chloroform is being administered, or at places where death by drowning is liable to occur, in order that a Faradaic current may be at once applied to the phrenic nerves where they pass over the scaleni muscles. There is no more effectual means of procuring artificial respiration than this. (Mr. Carter, p. 241.)

Pacini's Plan of Artificial Respiration.—The following plan of artificial respiration is that of Pacini, of Naples. Place the patient on his back on a table or bed, and let the operator have his abdomen against the head of the patient, and place his hands in the axillæ, on the dorsal aspect, and then pull the shoulders towards him with an upward movement at the same time.

The shoulders should then be relaxed, then the former movement, and so on alternately. The air sometimes makes a loud noise when it passes the larynx. (Dr. E. P. Bain, p. 240.)

Disinfection with Carbolic Acid Vapour.—The employment of carbolic acid vapour as a disinfectant is recommended in cholera or fever hospitals. The acid should be placed in a small porcelain dish which is to be floated in a larger vessel of hot water, and the heat of the latter is to be maintained by means of a gas jet, or similar means. (Dr. J. B. Russell, p. 228.)

Improved Syringe-pipe for Hypodermic Injection.—A gold syringe-pipe may with advantage be fitted with a solid steel spear-point. By this means we avoid the liability to corrode, which is characteristic of steel needles, and at the same time are enabled to pierce the skin with ease. (Dr. T. Buzzard, p. 227.)

Lead Poisoning.—*Sulphates and Iodides.*—The two chief remedies for lead poisoning are the sulphates and iodides. The former render the lead inert, by reducing it to its most insoluble form, and the latter eliminate it after rendering it as soluble as possible. The lead is eliminated as an iodide of lead and potassium, which is very soluble. The sulphates are most suitable for the treatment of acute cases, the iodides for chronic. As good a formula as any for the administration of sulphates is the following: Magnesiæ sulphatis ʒ ij., acidi sulphurici diluti ♏ x., tinctura hyoscami ♏ xx., aquæ menthæ piperitæ ʒj., ter die. (Dr. E. Clapton, p. 242.)

Snake-Bites.—*Dr. Halford's Remedy.*—Professor Halford's remedy for snake-bites is attracting a good deal of attention in Australia. A solution of ammonia is made of the strength of one part of strongest liquor ammoniæ to two parts of distilled water, and of this an ordinary hypodermic syringeful is injected into a vein. For this purpose an incision must be made through the skin, and the superficial radial vein exposed. The point of the syringe must be introduced through the coats of the vein. This has been tried upon animals, with great success, and once in the human subject. "The beneficial effect was immediate. From an almost pulseless state, and from a stupor verging on death the patient speedily became conscious." (p. 245.)

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The principles of medicine and surgery taught at the Eclectic Medical College, allow and require the fullest investigation, and provide that that investigation shall be untrammelled by any prescribed code or system of ethics; and at the same time enjoin the disuse of every agency, claimed to be remedial, which is liable to inflict permanent injury on the human constitution. The result has already been shown in the introduction of new medicines, generally obtained from indigenous plants, which have been safer, more successful, and in all respects preferable to those embraced in the Materia Medica of the old school. We have, without doubt, the most extensive Herbarium in existence, by the aid of which the student may become familiar with *all* the known indigenous remedies. No school of medicine in either hemisphere has discovered and applied so many important new remedies as the Eclectics of North America; and this is attested by the voluntary testimony of the most reputable medical journals of Europe, as well as by the fact that many of them have been adopted in the practice of "regular" physicians in this country under pretense of having been discovered by them. Chemical science is rapidly increasing the number, and thus keeping the Eclectic practice as a healing art and a learned profession, far in advance of all rivals. Instruction in an institution where

this practice is fully taught, is, therefore, essential to the student who desires in good earnest to be an intelligent and a successful practitioner.

It is the aim of the Eclectic Medical College of the City of New York, to fulfil all these indications. The most careful and critical instruction will be daily given by an accomplished faculty; the best opportunities afforded for clinical instruction by the professors, and at the numerous hospitals; the most approved text-books will be used; and in short every facility will be furnished at the command of the Institution. No other Eclectic College, east of the Alleghany mountains, has the same claim upon public confidence.

Such are the principles and policy of this Institution. We can magnify the Eclectic Medical Profession, and perpetuate it as a reputable system of practice, only by the most thorough instruction of its members. With this view, this college was established; and we now appeal to the friends of Eclectic Medicine everywhere, as they value its success and favor its dissemination, to add their endeavors for the maintenance of this institution.

Female students, from the first session of this College, have been educated upon the same conditions as male students. This is no innovation; but has been the case in the University of Zurich in Switzerland, of Hesse and other cities of Europe. It has been adopted generally by the Eclectic Medical Colleges of this country and with the most favorable results. The laws of the state have declared the right of women to instruction in the Medical College, and the sentiment of the age is fast determining in their favor as practitioners, in every part of the civilized world.

Instruction in several branches will be given to the female students in a separate department as may be needed.

The College is located on East Twenty-sixth Street, between Second and Third Avenues.

REQUISITES FOR GRADUATION.

Candidates for the degree of Doctor of Medicine must present satisfactory evidence that they have attained the age of twenty-one years, and are of good moral character; they must have studied medicine three years, with some respectable practitioner, and have attended two full Courses of Lectures, in some legally incorporated College, the last of which shall have been attended in this College; or they must have been engaged in a constant and reputable practice of medicine for four years, and have attended one full Course of Lectures in this College.

COURSE OF INSTRUCTION.

The Regular Session will begin on Wednesday, the 13th day of October, 1869, and will continue eighteen weeks, Lectures being given every day by the Professors in their several departments, the time of each one being indicated by a printed programme delivered to each Student. A preliminary course of two weeks will begin on the 4th day of October, at which all students are earnestly advised to be present.

Fees for a Full Course of Lectures	$100
Matriculation Fee	5
Demonstrator's Fee	5
Graduation Fee	30
Hospital Tickets	3
For Certificate of Scholarship for which the holder may attend two or more Courses of Lectures, or until he graduates, to be paid in advance	150
Scholarships, entitling the holder to keep a Student in the College for ten years	500
To keep one Student in the College perpetually	1,000

Good Board may be had in convenient proximity to the College for six or seven dollars a week. Students arriving in the city will call at the office of Professor Comins, No. 100 East 26th street, near Fourth Avenue, who will assist them in procuring suitable boarding places.

TEXT-BOOKS.

ANATOMY.—Gray; Wilson.

SURGERY.—Syme, by Newton; Erichsen; Gross; Hill.

THEORY AND PRACTICE.—Newton; Scudder; Jones & Sherwood; King; Wood.

MATERIA MEDICA.—Jones & Scudder; American and U. S. Dispensatories.

PHYSIOLOGY.—Dalton; Draper; Carpenter.

OBSTETRICS AND DISEASES OF WOMEN AND CHILDREN.—King; Tyler Smith; Scudder; Thomas; Newton & Powell; West.

CHEMISTRY.—Brande; Bowman; Miller; Draper.

PHARMACY.—King; Jones & Scudder; Coe; Hall; Parish; Proctor; Wood and Bache.

MEDICAL JURISPRUDENCE.—Beck; Taylor.

Any further information may be obtained by addressing

ROBERT S. NEWTON, M. D., PRES. FACULTY,

30 *East Nineteenth Street.*

GRADUATES OF 1869.

ALLEN, WILLIAM A., New York.
ARCHER, CHARLES H., New York.
ARCHER, Mrs. H. E., " "
ARCHER, WILLIAM, " "
BERRY, T. C. S., Maine.
BROWN, Mrs. E. A., Massachusetts.
CHAPMAN, BENJ. F., New York.
CHEESBROUGH, WILLIAM D., New York.
LINQUIST, M. F., " "
MILLER, ISAAC S., " "
OSTRANDER, Mrs. ZITELLA, " "
ROE, SYLVESTER, Jr., " "
SHATTUCK, L. A., Maine.
SMITH, WILLIS J., New York.
STARR, GEORGE O., "
SWEET, HOMER L., New Hampshire.

GRADUATES AD-EUNDEM.

DEWITT, E. W., Arkansas.
GEDDES, R. W., Massachusetts.
PERKINS, T. S., "

HONORARY GRADUATES.

CRANE, OLIVER, Pennsylvania.
HYDE, JOHN J., New York.
JONES, WILLIAM, "
McCARTNEY, JOHN, Ireland.
TUTHILL, SAMUEL, New York.

DISPENSARIES, INFIRMARIES, HOSPITALS.

THE ECLECTIC MEDICAL DISPENSARY which has daily a large attendance of patients, representing all forms of disease, and which is under the immediate direction of the Professors, will afford valuable opportunities to students for clinical instruction and observation.

There are several other large Dispensaries in the city in which over 80,000 patients are annually treated.

THE EYE AND EAR INFIRMARIES afford ample means of instruction in Diseases of the Eye and Ear.

BELLEVUE HOSPITAL, THE STATE EMIGRANT HOSPITAL, ST. VINCENT'S HOSPITAL, JEWS' HOSPITAL, ST. LUKE'S HOSPITAL, N. Y. STATE WOMAN'S HOSPITAL, BLACKWELL ISLAND'S HOSPITAL AND THE LYING-IN-ASYLUM, are open to students of our College.

In addition to the above clinical advantages, medical instruction will be imparted by means of Cliniques held at the College by the Professors.

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